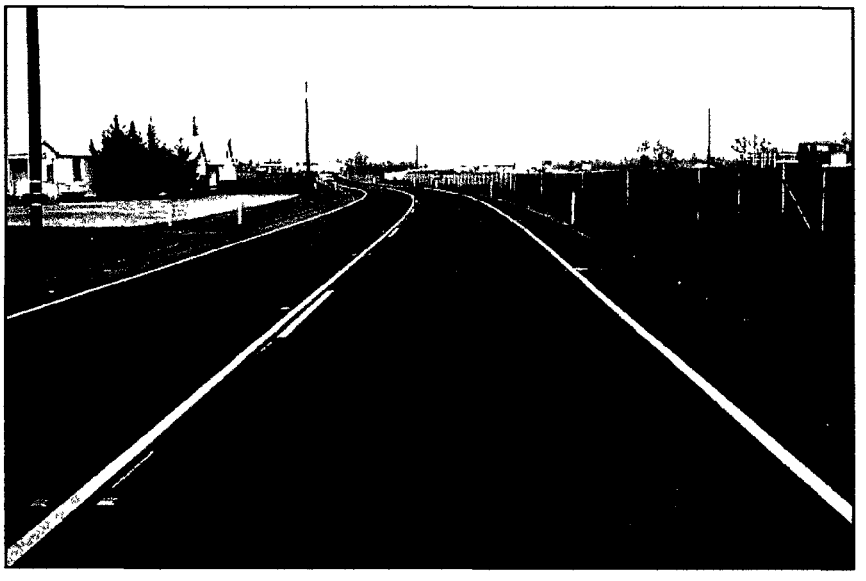
FEDERAL HIGHWAY ADMINISTRATION
Long Term Pavement Performance (LTPP)
Specific Pavement Studies

CALIFORNIA SPS-8

Construction Report on Site 06A800
Sycamore Street

DRAFT



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ABSTRACT

Environmental conditions, alone or interacting with pavement materials, may generate major distresses in pavements. The impact of long term performance of pavements has been difficult to quantify, as have the interactions between environmental stresses and load stresses. Under the Strategic Highway Research Program (SHRP), Specific Pavement Studies (SPS), experimental studies are carried out as part of the Long Time pavement Performance (LTPP) program across the country. The SPS-8 experiment, "Strategic Study of Environmental Factors in the Absence of Heavy Loads," is a study designed to evaluate the effect of environmental factors on the performance of both flexible and rigid pavements. The California SPS-A8 sections combine two asphalt concrete sections of varying granular base and surface course thickness in a low traffic environment. The environmental conditions will be continuously monitored with the weather station installed at this site. Over time, the effect of environment on the performance of these sections will be monitored. These sections are labeled SPS-A8 as two rigid SPS-8 sections were already built in California.

Two SPS-A8 asphalt concrete sections of varying base and surface course thicknesses were constructed on the northbound lane of Sycamore Street. Sycamore Street is a low traffic frontage road to US-99 at Delhi, about 18 miles (29 Km) south of Modesto, California. The automated weather station at this site collects wind speed, ambient temperature, precipitation and solar radiation data on a continuous basis. Construction of the test sections began in May 1999 and the paving operations were completed on September 29, 1999. The test sections were opened to traffic on November 18, 1999. This report is a summary of the SPS-A8 construction process and operations, deviations, and problems that were observed during the construction process that may affect the pavement performance.

I. INTRODUCTION

The SHRP SPS-8 experiment was designed to more precisely determine the relative impact of environmental factors that influence the performance of flexible and rigid pavements in the absence of heavy traffic loads. Environmental conditions alone or interacting with pavement materials may generate major distresses in pavements. Frost heave, soil swell, and transverse low temperature cracks are common environmentally related distresses which have little or no traffic related component.

This report covers the construction of the SPS-A8 test sections on the northbound lane of Sycamore Street, a frontage road for SR99 at Delhi, 18 miles (29 Km) south of Modesto, California. This section of the report briefly explains the organization of this report and topics covered under various sections. Section II of this report gives the project location, description and attributes, and the key organizations and personnel involved. Section III covers the construction sequence and process. The construction of test sections is summarized in section IV and finally the key observations are documented in section V.

Appendix A presents the photographs of construction activities, appendix B the mix design, the sampling plan is presented in appendix C, and finally the construction data forms are enclosed in appendix D.

SPS-8 PRODUCTS

The primary products of the SPS-8 experiment are:

- Evaluation of existing environmental effects (damage) models.
- Determination of the effects of specific design features, thickness and pavement type, on pavement performance in the absence of heavy traffic loads.
- Development of a comprehensive database for use by state and provincial engineers and other researchers for evaluating environmental effects on pavement performance.

II. SPS-A8 PROJECT DESCRIPTION

This section of the report describes in detail the geographical location, section layout, climatic zone, subgrade and structural attributes, and construction of individual sections.

LOCATION AND LAYOUT

This SPS-A8 is located on the northbound lane of Sycamore Street, a frontage road to US99 in Delhi, Merced County. Delhi is about 18 miles (29 Km) south of Modesto, California. The GPS coordinates of the beginning of the project are 37° 24.993' N latitude and 120° 45.571' W longitude. The project is located at an elevation of 36.0m (118.0 ft). Figure 1 presents the geographic location of the project. The project consisted of construction of two asphalt concrete (AC) sections (SPS-A8).

Section 06A805 was 100mm of AC over 205mm of crushed aggregate base and section 06A806 was 180mm of AC over 305mm of crushed aggregate base. The layout, stationing, order, and structural attributes of individual sections are presented in figure 2 and table 1.

Table 1. Test section details of California SPS-A8.

Section	Location	Construction Stationing (m)	Test Section Stationing (m)	Structural Details
06A805	Begin Transition	103+60.0	0-20.0	
	Begin Monitoring	103+80.0	0+00.0	HMAC 100mm
	End Monitoring	105+32.4	1+52.4	
	End Transition	105+60.0	1+80.0	DGAB 205mm
06A806	Begin Transition	106+60.0	1+80.0	
	Begin Monitoring	106+30.0	0+00 0	HMAC 180mm
	End Monitoring	107+82.4	1+52.4	
	End Transition	108+00.0	1+70 0	DGAB 305mm

CLIMATE

The project is located in the LTPP "Dry-No Freeze" climatic zone. The estimated average precipitation at the project location is 316 mm. The average maximum and minimum temperatures during the summer and winter seasons are enumerated below:

	Summer	Winter
Average Maximum Temperature	34.7 °C	14.2 °C
Average Minimum Temperature	14.6 °C	2.8 °C

TRAFFIC

The estimated annual average daily traffic (AADT) in two directions for these study sections is 1,240 vehicles. For a design period of 20 years, the total design 18K ESALs is estimated at 480,000.

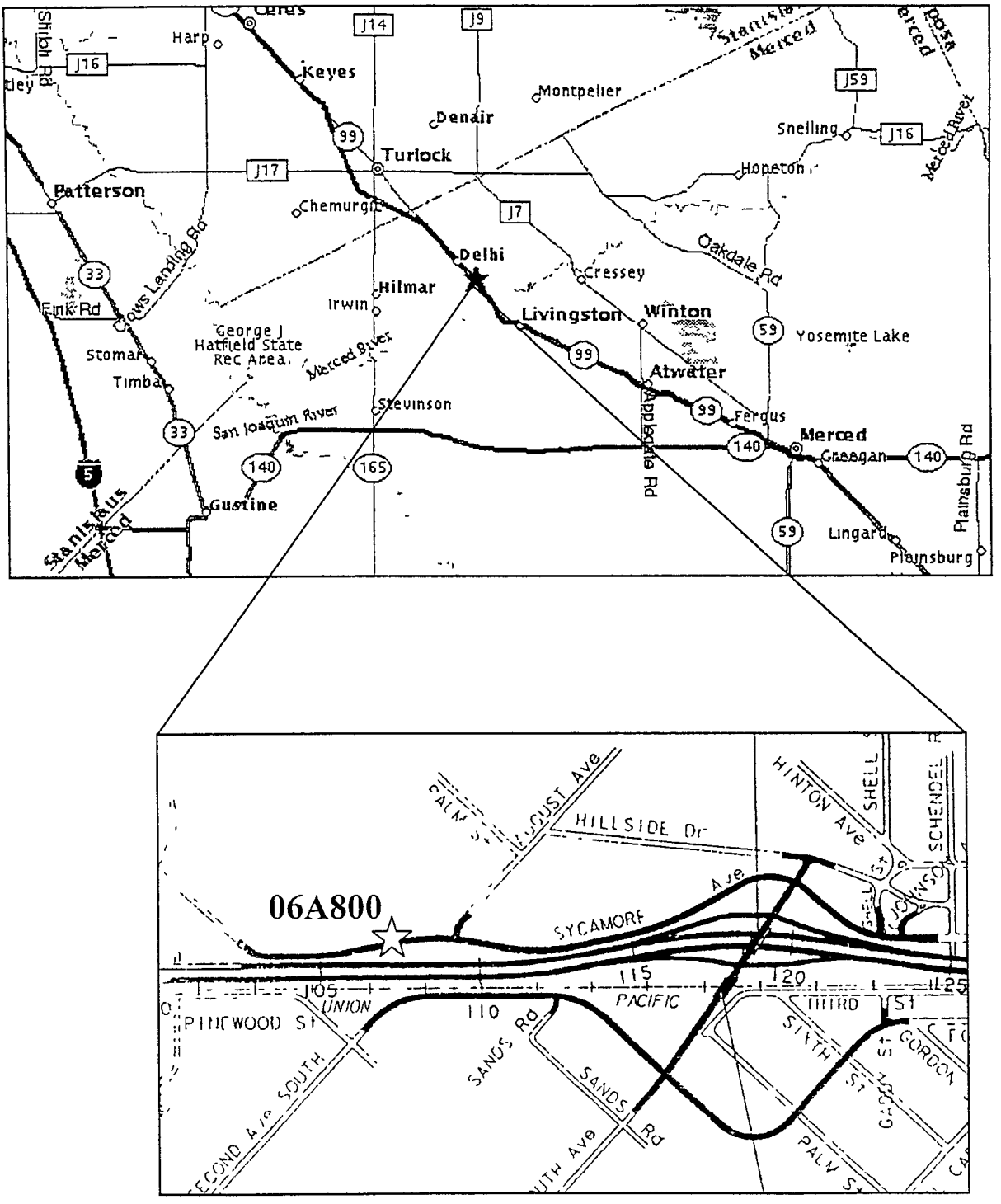


Figure 1. 06A800 site location.

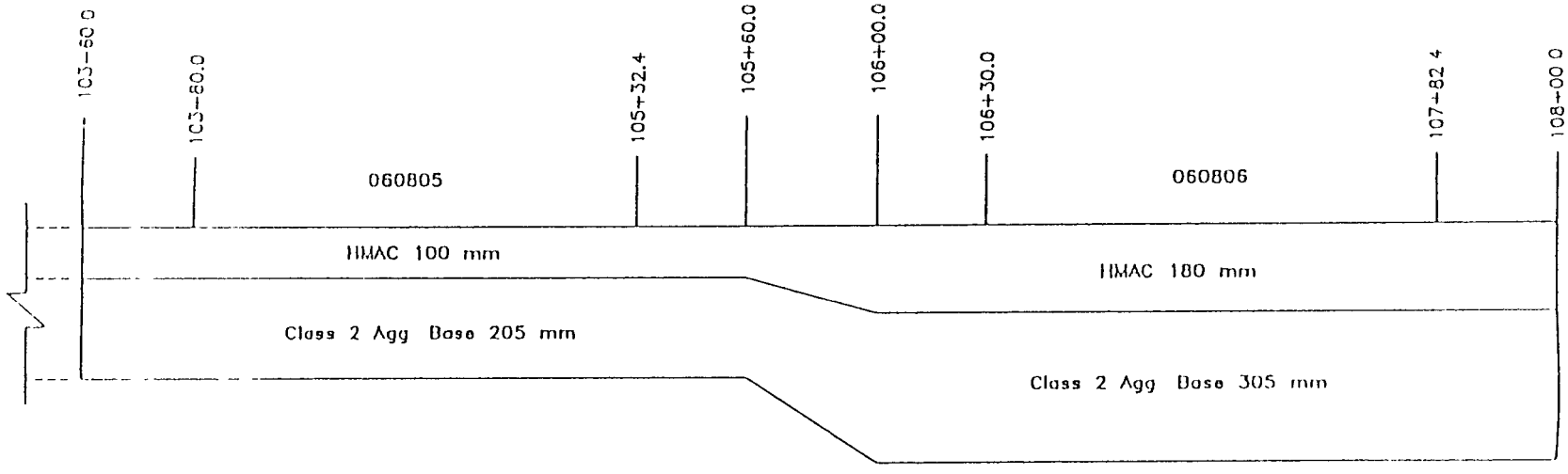


Figure 2. Layout of experimental test sections.

GEOMETRICS AND SUBGRADE

The SPS-A8 test sections were constructed on a gentle grade (< 1.0%) and gently curving alignment. Both sections were built on an existing unpaved frontage road alignment but they were completely new construction. The test sections were built on natural fine graded sandy subgrade.

AGENCIES AND PERSONNEL

This project was constructed under the supervision of Caltrans, FCI Constructors was the principle contractor. All LTPP required material sampling and baseline elevation surveys on various layers were performed by Caltrans personnel. The following personnel were involved in the project at various phases of construction.

Caltrans

Ms. Pamela Marquez was the resident engineer for this project assisted by Kurosh Boroshan, the assistant resident engineer. Rodney Soderlund was the subgrade and base materials inspector. George Crowley was the chief field technician assisted by Douglas Hammerstaad and Manpreet Singh in field sampling and testing. Bing Long and Robert Sugar were representing the Caltrans headquarters.

FCI Constructors

Greg Le Blanc was the project manager, Rudy Bravo, the construction superintendent for the project, Jerry Miller was the subcontractor for subgrade and unbound base work and, Tom Mayo Construction from Stockton was the subcontractor for AC construction.

Western Region Coordination Office Contractor (WRCOC)

Pete Pradere and Srikanth Holikatti from Nichols Consulting Engineers, Chtd. (NCE) were present for all phases of construction. NCE personnel installed an Automated Weather Station (AWS) within a mile of the test sections to assure proper climatic data would be available during analysis. The equipment was installed December 6, 2000, following the completion of construction on the nearby SPS-2 project. The installed equipment consists of a wind monitor that measures wind speed and direction, a probe to measure the temperature and humidity, a pyrenometer to measure solar radiation, a rain gauge tipping bucket, a solar panel, and a datalogger. All AWS equipment was provided by FHWA.

III. CONSTRUCTION

This section of the report covers the actual construction operations, material sampling, and field testing performed during construction, and any deviations that occurred during the SPS-A8 construction process.

Construction work of the SPS-A8 project began in May 1999. Initial work on Sycamore Street consisted of complete removal of the existing asphalt concrete surface at the beginning of section 06A805, excavation and removal of the existing base course to the subgrade, and de-vegetation and grubbing in the rest of the project. The construction plans called for the complete removal of this material and preparation of subgrade before the placement of subsequent layers. The longitudinal profile of the roadway did not warrant any embankment.

EQUIPMENT

The following equipment was used in the processing and construction work of subgrade and aggregate base layers on both SPS-A8 test sections.

- 2 CAT 623F Scrapers
- 2 Ingorsoll Rand Series 100 Steel Drum Vibratory Rollers
- 1 CAT 140H Motor Grader
- 1 CAT 140C Motor Grader
- 2 Front End Loaders
- 8 Belly Dump Trucks
- 3 Water Trucks

SUBGRADE PREPARATION

Initial work on Sycamore Street consisted of complete removal of the existing asphalt concrete surface at the beginning of section 06A805 and excavation and removal of the existing base course to the subgrade. The subgrade was worked with graders and scrapers to achieve proper distribution of the material and to approximate the required profile. Final grade and profile of SPS-A8 was completed in September 1999. Water trucks, pneumatic rollers, and steel rollers were used to attain the target compaction and moisture content.

Bulk Sampling

Bulk sampling of finished subgrade was performed on September 17, 1999 by excavating test pits. The bulk sampling pits were backfilled with similar subgrade material and compacted to the Caltrans specs. A summary of subgrade bulk sample locations, stationing, and sample numbers are given in table 2.

Table 2. Subgrade bulk sample locations, SPS-A8 California.

Section #	Bulk Sample #	Section Station	Project Station	Offset Rt. Of Centerline
06A805	BZ1	0-10.0	103+70.0	2.2 m
06A806	BZ2	0-10.0	106+20.0	2.2 m

The subgrade gradations are presented below in table 3. The material has been classified as 204 (poorly graded sand with silt) per the SHRP/LTPP classification system.

Table 3. Subgrade gradations, SPS-A8 California.

Sieve Size (mm)	Percent Passing	
	Section 06A805	Section 06A806
75.0	100	100
50.0	100	100
37.5	100	100
25.0	100	100
19.0	100	100
12.5	100	100
9 5	100	100
4 75	100	100
2.0	100	100
0.425	72	71
0.180	32	35
0.075	11.4	14 0

Inspection

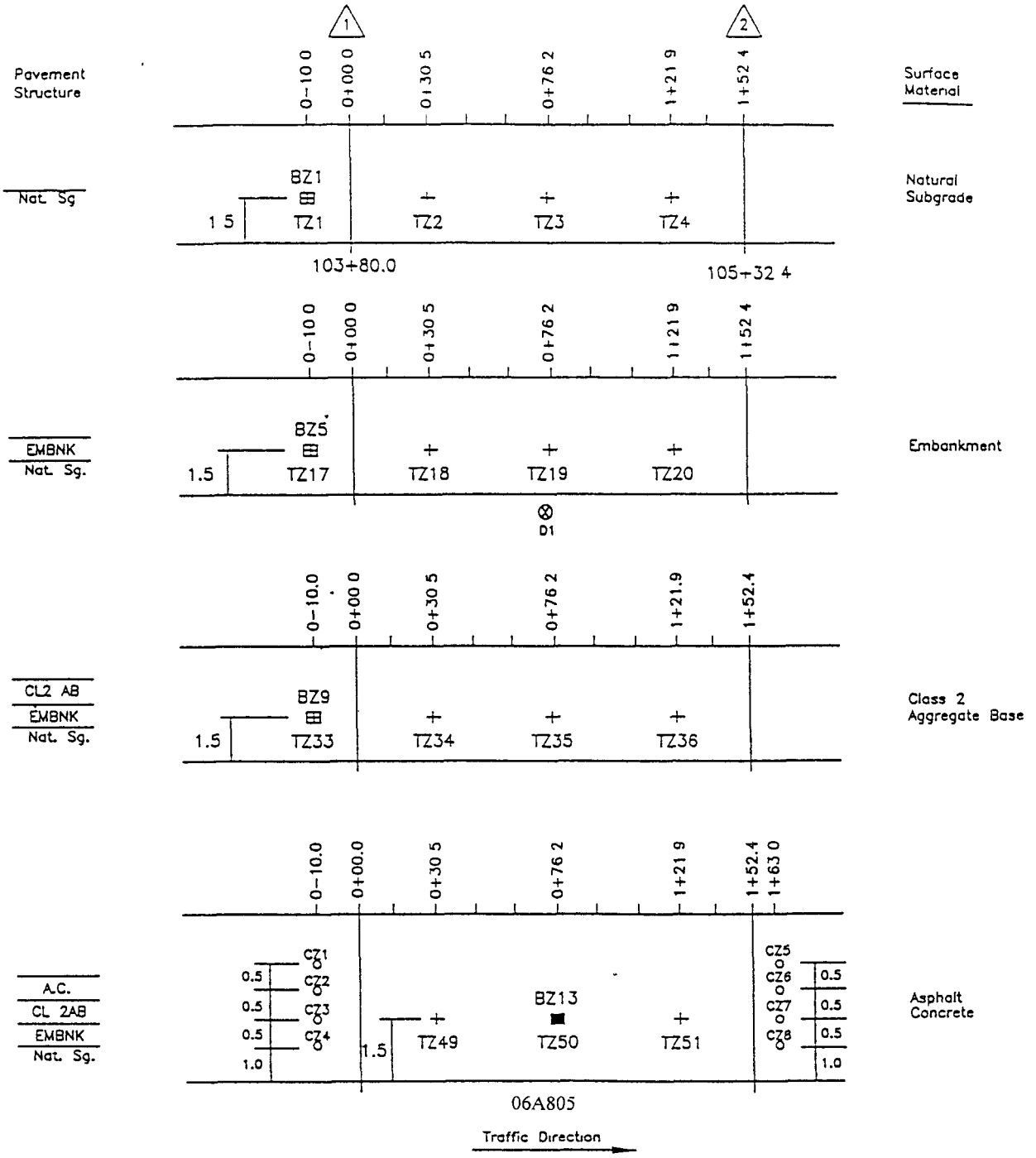
The finished subgrade was visually inspected for problem areas, soft spots, etc., but none were observed.

Field Density and Field Moisture Testing

Field density and field moisture tests were performed on prepared subgrade layer on September 1999. The density tests were carried out using nuclear gauge (ID#988) at locations shown in figures 3 and 4 in accordance with the procedures in AASHTO T239-97. The results of the density tests are tabulated in table 4.

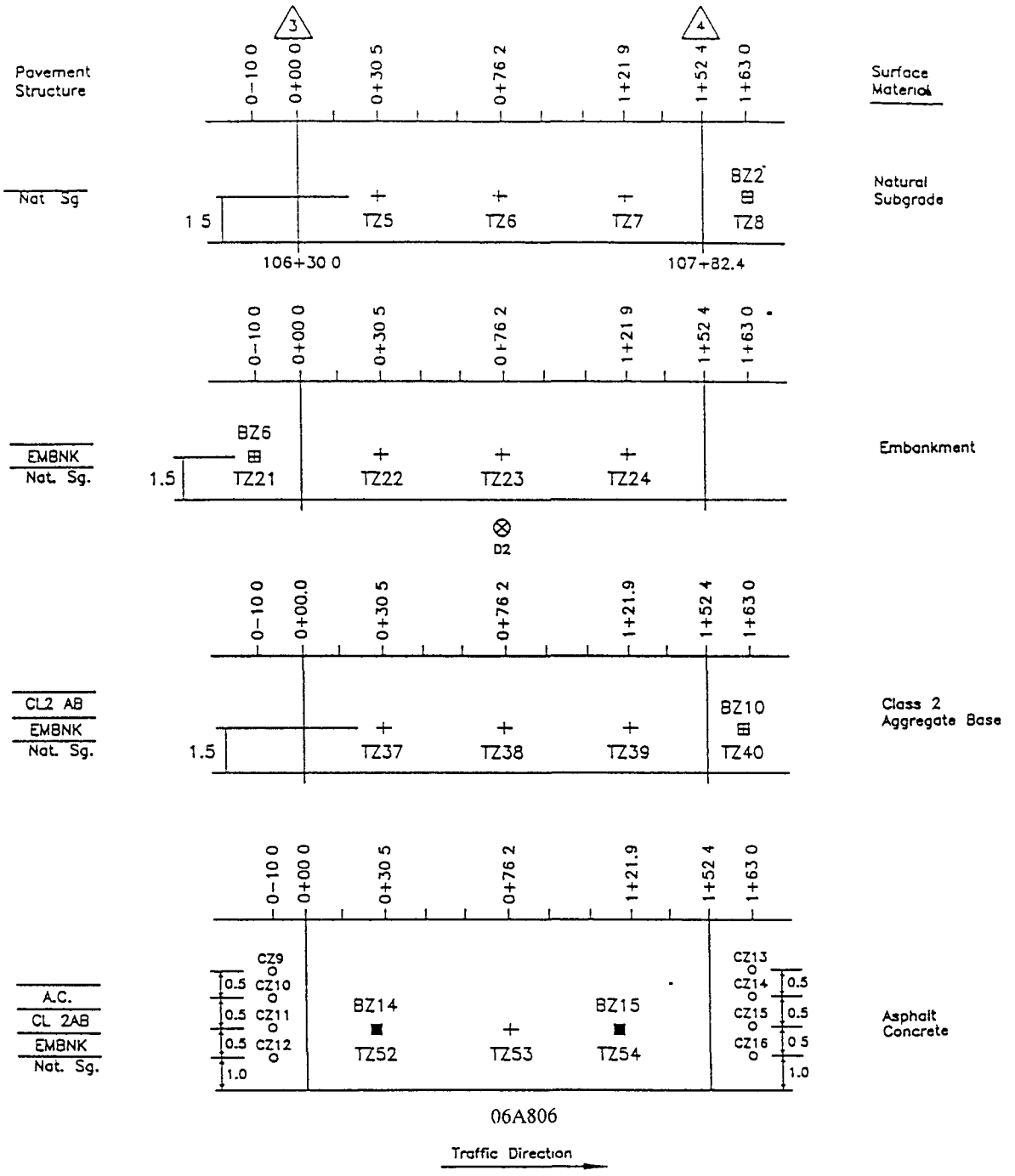
Table 4. Subgrade field density and moisture test results, SPS-A8 California.

Section	Project Station	Section Station	C/L Reference	Average In-Situ Density (T/M^3)	% of Max Dry Density (T/M^3)	In-Situ Moisture Content (%)	% Optimum Moisture Content
06A805	103+70.0	0-10.0	2.1m Right	2.00	108	5 1	46
	104+10.5	0+30.5	2.1m Right	2.02	109	5.7	52
	104+56.2	0+76.2	2.1m Right	2.00	108	5.8	53
	105.01 9	1+21.9	2 1m Right	1 97	106	4.3	39
06A806	106+20.0	0-10.0	2.1m Right	1.90	103	2.5	24
	106+60.5	0+30.5	2.1m Right	1.88	102	2.1	20
	107+06.2	0+76.2	2.1m Right	1.90	103	2.2	21
	107+51.9	1+21.9	2.1m Right	1.93	104	3.4	32



⊗ D1 – 6.1m Shoulder Probe
\+ TZ1–TZ4 – Moisture–Density tests on Natural Subgrade
□ BZ1 – Bulk sampling of Natural Subgrade
□ BZ5 – Bulk sampling of Prepared Subgrade/Embankment
\+ TZ17–TZ20 – Moisture–Density tests on Embankment/Prepared Subgrade
□ BZ9 – Bulk sampling of Class 2 Agg. Base
\+ TZ33–TZ36 – Moisture–Density tests on Class 2 Agg Base
■ BZ13 – Bulk samples of Asphalt Concrete
BCZ13 is a bulk sample of Asphalt Cement from the plant
– TZ49–TZ51 – Density tests on Asphalt Concrete
o CZ1–CZ8 – 102mm Cores of Asphalt Concrete
Note Shoulder probe testing may be performed at a later time

Figure 3 Overview of sampling, testing and coring plan for asphalt concrete section 06A805, SPS-8 California



⊗ D2 – 6.1m Shoulder Probe
\+ TZ5–TZ8 – Moisture–Density tests on Natural Subgrade
□ BZ2 – Bulk sampling of Natural Subgrade
□ BZ6 – Bulk sampling of Prepared Subgrade/Embankment
\+ TZ21–TZ24 – Moisture–Density tests on Embankment/Prepared Subgrade
□ BZ10 – Bulk sampling of Class 2 Agg Base
\+ TZ37–TZ40 – Moisture–Density tests on Class 2 Agg Base
■ BZ14–BZ15 – Bulk samples of Asphalt Concrete
BCZ14 and BCZ15 are bulk Asphalt Cement samples from the plant
\+ TZ52–TZ54 – Density tests on Asphalt Concrete
o CZ9–CZ16 – 102mm Cores of Asphalt Concrete

Figure 4 Overview of sampling, testing and coring plan for asphalt concrete section 06A806, SPS-8 California

Prepared Subgrade Surface Elevations

Baseline elevation surveys on the surface of prepared subgrade were carried at locations indicated in figure 5. The purpose of the elevation surveys is to obtain a profile of prepared subgrade surface and to determine the thickness of subsequent layers. The variation found in the subgrade layer profiles has been ascribed to rod reading differences by Caltrans.

FWD Testing

Falling Weight Deflectometer (FWD) testing of the subgrade for both sections was performed on September 13, 1999 by the Western Regional Coordination Office Contractor (WRCOC) in accordance with the procedures and guidelines outlined in Specific Pavement Studies Directive Number S-4, "Deflection Testing of Subgrade and Base Layers for SPS-1, -2 and -8 Experiments." As can be seen in figures 6 and 7, the midlane deflection profiles for the subgrade layer are comparable without any significant differences. The loads for sections A805 and A806 were approximately 380 and 390 kPa, respectively.

DENSE GRADED AGGREGATE BASE (DGAB)

Construction of dense graded aggregate base (DGAB) began on September 14, 1999 and was completed on September 27, 1999. The DGAB material consisted of crushed river gravel, and was brought in by belly dump trucks. It was then windrowed and worked by the graders and blades to achieve the required grade and profile. Water trucks, steel wheel rollers, and pneumatic rollers were employed to achieve target compaction and moisture. The nominal layer thickness for sections varied between 205mm to 305mm as previously indicated in figure 2.

Inspection

The finished DGAB layer was visually inspected for problems and none were observed. The transition between the AC sections (station 105+60.0 to station 106+00.0) the DGAB layer thickness was maintained constant, as opposed to having a gradual transition to accommodate the change in surface layer thickness, creating a slight drop at station 105+60.0.

Bulk Sampling

Bulk sampling of DGAB material was performed by excavating a test pit in the finished layer that would provide the required quantity of material. After the bulk sampling, the pits were back filled with similar material and compacted to the target density. Bulk sample numbers, locations, sections, and stationing information is tabulated in table 5. Table 6 presents the gradation information for the dense graded aggregate base.

Table 5. Dense graded aggregate base bulk sample locations, SPS-A8 California.

Section #	Bulk Sample #	Section Station	Project Station	Offset Rt. Of Centerline
06A805	BZ1	0-10.0	103+70 0	2.2 m
06A806	BZ2	0-10.0	106+20.0	2.2 m

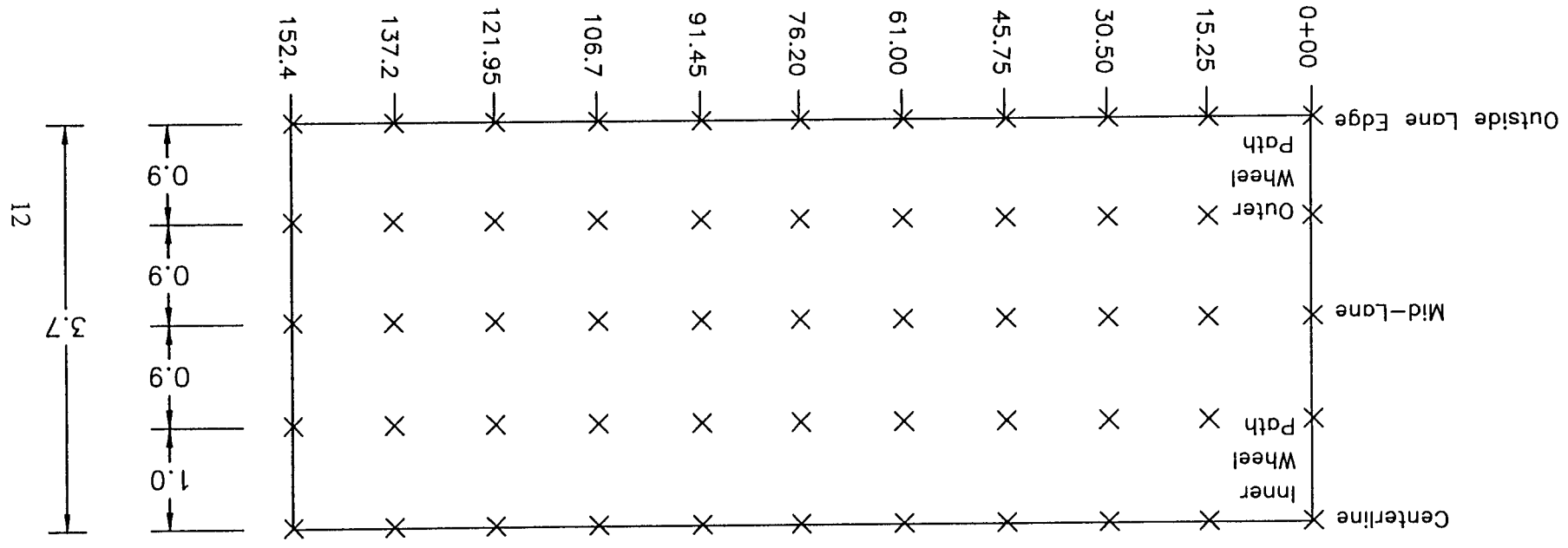


Figure 5. Test section elevation measurement location for SPS-8 California.

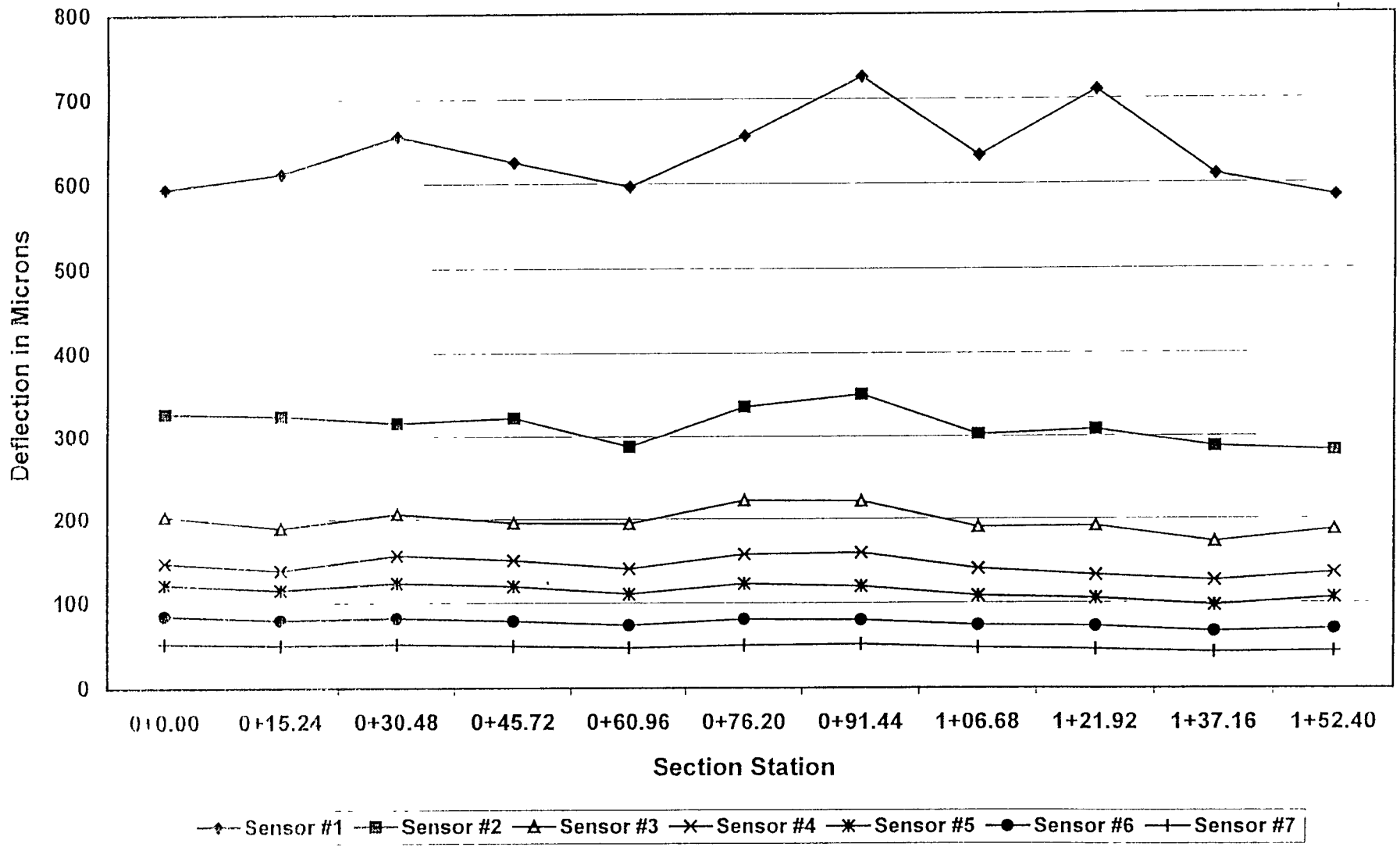


Figure 6. Subgrade deflection profile, section 06A805.

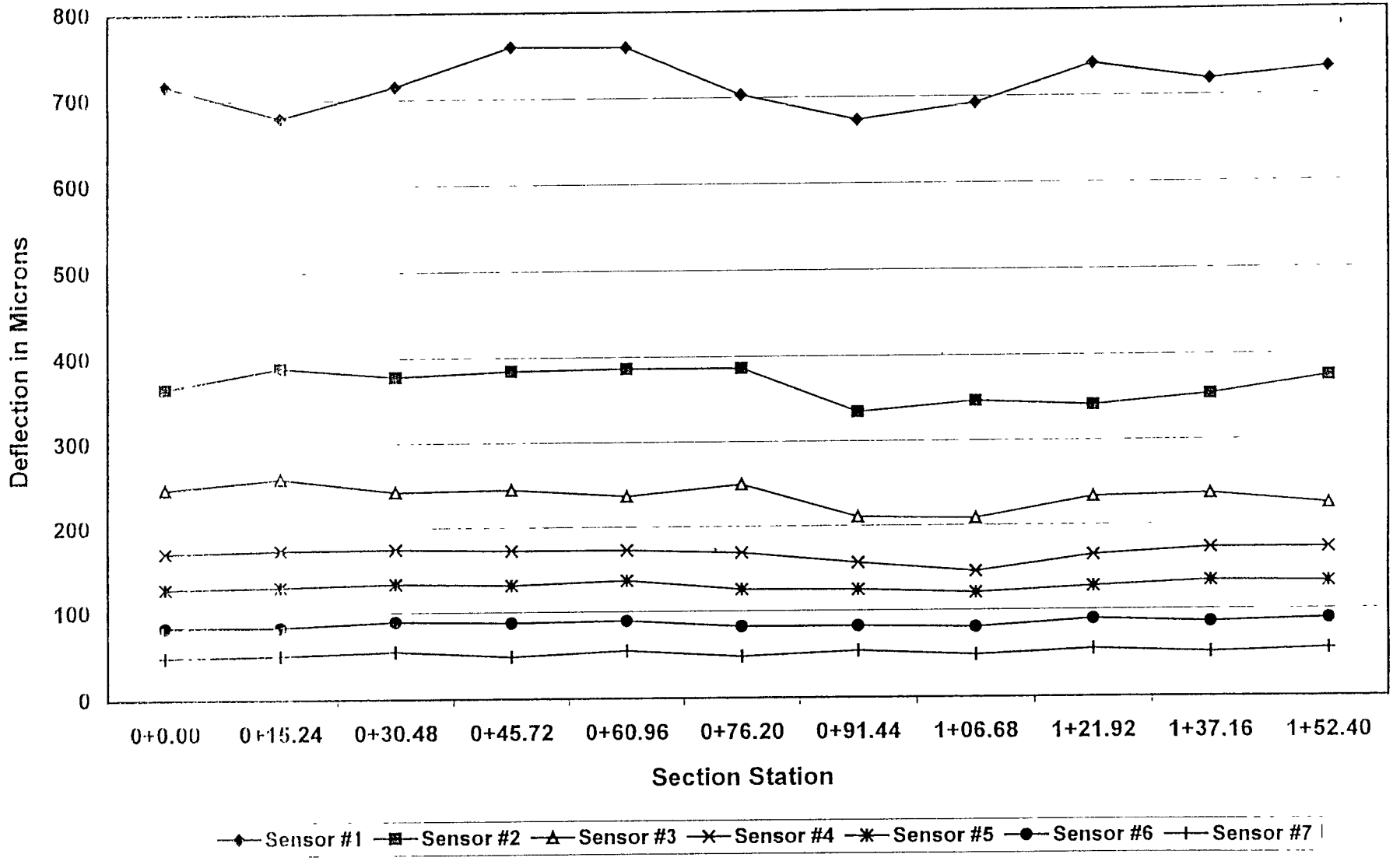


Figure 7. Subgrade deflection profile, section 06A806.

Table 6. Dense graded aggregate base gradations, SPS-A8 California.

Sieve Size (mm)	Percent Passing	
	Section 06A805	Section 06A806
75.0	100	100
50.0	100	100
37.5	99	100
25.0	85	96
19.0	73	84
12.5	56	76
9.5	44	51
4.75	37	35
2.0	23	2
0.425	13	15
0.180	11	11
0.075	8.6	8.0

Field Density and Field Moisture Tests

Field density and field moisture content tests were performed on September 17, 1999 on the finished DGAB layer in accordance with AASHTO T 238-97 and T239-97, respectively, at locations indicated in figures 3 and 4. The test results are tabulated in table 7.

Table 7. Dense graded aggregate base field density and moisture test results, SPS-A8 California.

Section	Project Station	Section Station	C/L Reference	Average In-Situ Density (T/M^3)	% of Max Dry Density (T/M^3)	In-Situ Moisture Content (%)	% Optimum Moisture Content
06A805	103+70.0	0-10.0	2.1m Right	2.35	104	3 4	52
	104+10.5	0+30.5	2.1m Right	2.37	105	3 2	49
	104+56.2	0+76.2	2.1m Right	2.32	103	3.4	52
	105.01.9	1+21.9	2.1m Right	2.32	103	2.9	45
06A806	106+20.0	0-10.0	2.1m Right	2 37	106	3 4	52
	106+60.5	0+30.5	2.1m Right	2.36	105	3 2	49
	107+06.2	0+76 2	2 1m Right	2.33	104	2.9	45
	107+51 9	1+21.9	2.1m Right	2.33	104	3.1	48

Finished DGAB Surface Elevations

Elevation surveys on the surface of prepared DGAB were carried out at locations indicated in figure 5. The purpose of the elevation surveys is to obtain a profile of prepared DGAB surface and to determine the as built thickness of DGAB layers. The as-built DGAB thicknesses are in table 8.

Table 8. As-built AC layer average thickness (mm), SPS-A8 California.

Section Station	Section 06A805	Section 06A806
0+00.00	198	304
0+15.25	204	299
0+30 50	197	314
0+45.75	209	310
0+61.00	207	301
0+76.20	202	302
0+91.45	204	297
1+06.70	203	300
1+21.95	202	300
1+37.20	198	299
1+52.40	195	301
Average	202	302

FWD Testing

FWD testing of the DGAB layer for sections 06A805 and 06A806 was performed on September 17, 1999, by the WRCOC. The testing was performed in accordance with the procedures and guidelines outlined in Specific Pavement Studies Directive Number S-4, "Deflection Testing of Subgrade and Base Layers for SPS-1, -2 and -8 Experiments." The midlane deflection profiles for both the sections are presented in figures 8 and 9. The loads for sections A805 and A806 were approximately 580 kPa for each, which is approximately 200 kPa higher than the loads plotted for the subgrade (figures 6 and 7).

ASPHALT CONCRETE (AC) PAVEMENT

Asphalt concrete paving of the SPS-A8 sections began on September 27, 1999 and was completed on September 29, 1999. The detailed AC mix design is enclosed in appendix B. A brief description of the AC mix design is presented in table 9.

The material was supplied from a batch plant located at Winton, about 15 miles from the project location involving about 20-25 minutes of travel time. The batch plant was a 1970s model plant with different aged parts. The capacity of the plant was 225 to 250 tons per hour. The plant had two 180 ton silos.

The mix was produced utilizing the following five aggregate stockpiles:

Rock Dust	27.5%
Washed sand	19.5%
9.5mm	18.5%
12.5mm	14.5%
20.0mm	22.1%

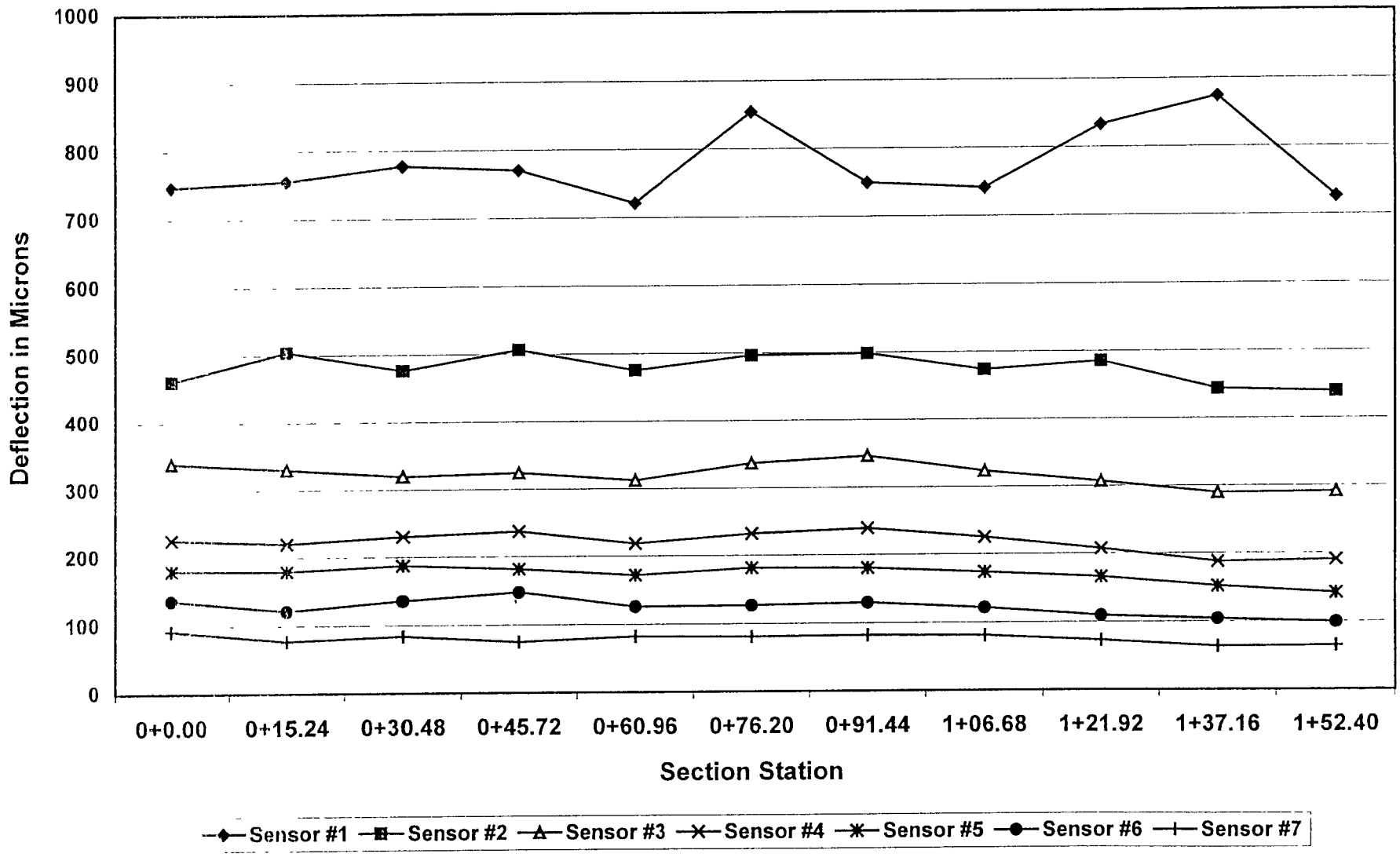


Figure 8. DGAB deflection profile, section 06A805.

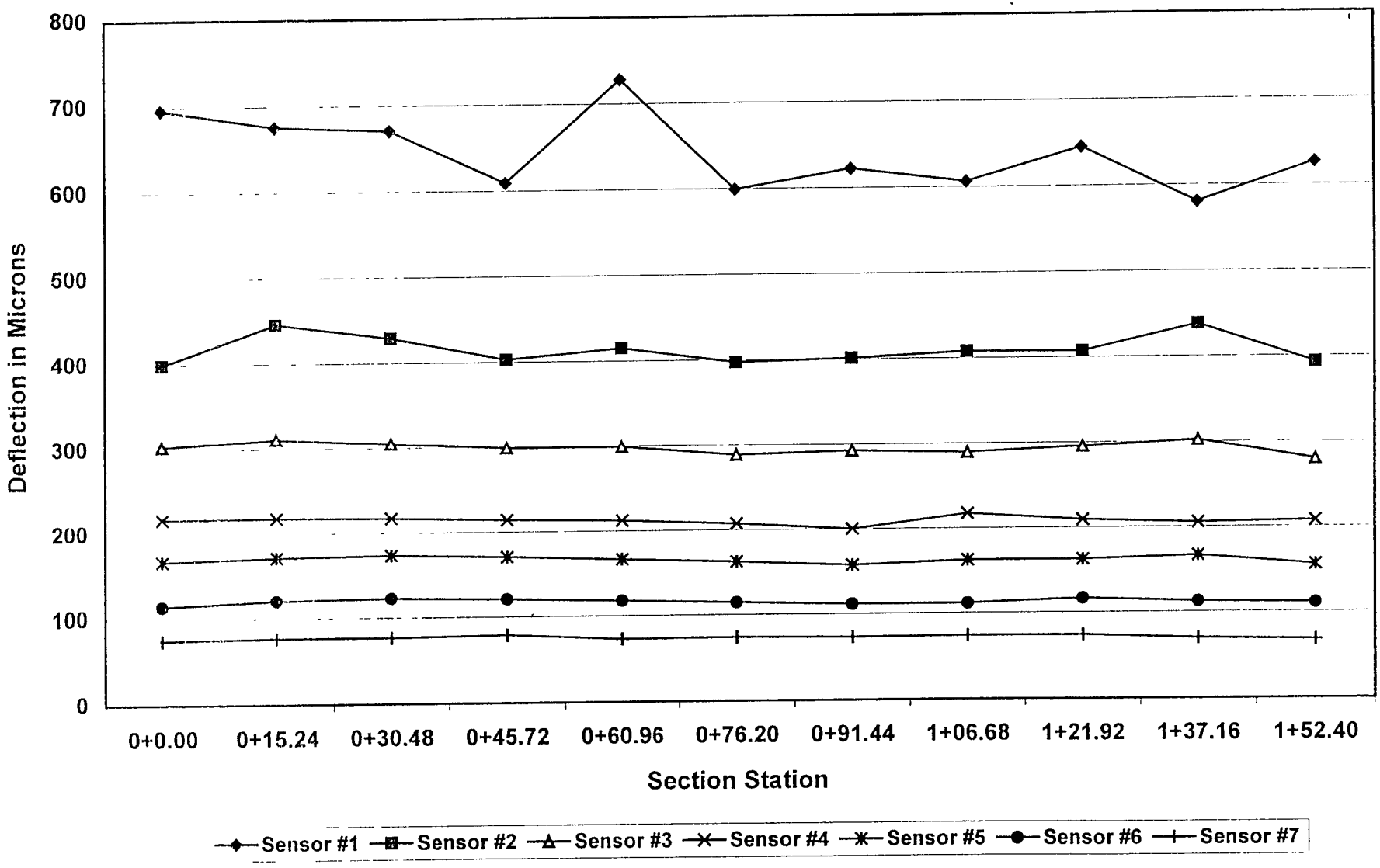


Figure 9. DGAB deflection profile, section 06A806.

Table 9. AC mix design used in SPS-A8 California.

Aggregate Type	Crushed Gravel, Santa Fe Aggregate
Aggregate Specific Gravity	Fine: 2 74 Coarse· 2 70 Avg: 2.72
Asphalt Cement	AR 4000, San Joaquin Refining Company
Recommended Asphalt Content	5.6%
Recommended Air Voids	4 0%
Hveem Stability	49
Swell	0 076mm
Mixing Temperature	149°C
Compaction Temperature	110°C
Aggregate Gradation	
Sieve Size (mm)	Percent Passing
25.0	100
19 0	98
12.5	86
9.5	72
6.3	60
4.75	50
2.36	36
1.18	28
0.6	18
0.30	10
0 15	5
0 075	3

The AC mix gradations obtained from cold feed samples are presented in table 10.

Table 10. Combined cold feed gradations for asphalt concrete, SPS-A8 California.

Sieve Size (mm)	25.0	19.0	12.5	9.5	4 75	2.36	1 18	0 60	0 30	0 15	0.075
Combined Gradation	100	98	82	73	48	34	28	23	14	6	3
Caltrans Operating Range	100	95 to 100		65 to 80	45 to 59	30 to 42		16 to 24			1 to 5

The following equipment was used in the paving operations:

- 1998 Cedar Rapids CR551 pneumatic tired paver with hydraulic extendable screed and a smooth trac ultra sound 30' ski
- Cedar Rapids pickup machine.
- Caterpillar CB634C double drum 12 ton vibratory roller for breakdown rolling.
- Hyster C530 7 ton pneumatic roller for intermediate rolling
- Ingersoll Rand DD70 double drum 12 ton vibratory roller for finish rolling
- Double trailer bottom dump trucks

Paving operations began on the northbound lane of Sycamore Street on the morning of September 27, 1999. AC material was first placed at the southern end of Sycamore Street up to station 103+60, which was not part of the SPS-A8 project. AC was not placed between station 103+60 to station 106+00. However, the first lift for section 06A806 was placed from station 106+00 onward to the end of the project.

There was some delay in the morning as the contractor had to weld some new mounts for the ultrasonic ski on the paver. This resulted in AC material to sit in trucks for nearly an hour. This did not seem to have any detrimental effect on the mixture. The material was placed in a windrow from the trucks onto the DGAB in front of the paver. This was then loaded into the paver hopper by the pickup machine and spread into a uniform thickness. There were some screed marks on the surface of the pre-compaction mat caused by the improper adjustment of screed extensions. The uncompacted thickness of this lift was 90-100mm. The mat thickness was controlled by using the ultrasonic screed at the centerline and slope by the paver. This screed uses five sensors placed uniformly along the screed and averaged their readings. The mix temperatures during the two paving days were in the range of 129°C to 145.4°C.

Compaction of the mat was achieved by the following rolling pattern:

- Three passes of double drum 12 ton roller in vibratory mode for breakdown
- Two passes of 7 ton pneumatic roller for intermediate finish
- Two passes of 12 ton double drum roller with one pass each in vibratory and static mode, respectively.

This rolling pattern was fairly uniformly maintained. There was severe pickup problem during intermediate rolling. Even though the water-spray system was being used, it did not help alleviate the pickup problem on this lift.

The lifts paved on September 27, 1999 were sprayed with tackcoat. Work on the first lift of section 06A805 began on the morning of September 29, 1999. The second lift of section 06A806 was completed in the same pass. The final lift for both the sections was finished early afternoon. The uncompacted mat thickness for both lifts varied between 60mm - 70mm range. Both these lifts had some screed marks. The rolling pattern was the same pattern reported previously. There were no pickup problems with the pneumatic roller on the second paving day, as the pneumatic roller wheels were heated to sufficient temperature. The paving operations went on generally smoothly with small stoppages (1-2 minutes) for trucks, the longest stoppage being 10 minutes. The asphalt concrete mix design is enclosed in appendix B.

Bulk Sampling of Asphalt Concrete

Bulk samples of asphalt cement used in the asphalt concrete was collected as were cold feed samples of coarse and fine aggregates at the plant. Bulk samples of loose mix from the windrow were collected at sampling locations previously indicated in table 11 and figures 3 and 4.

Table 11. Asphalt concrete bulk sample locations, SPS-A8 California.

Section #	Bulk Sample #	Section Station	Project Station	Offset Rt of Centerline
06A805	BZ13	0+76.2	104+56.2	2.2 m
06A806	BZ14	0+30.5	106+60 5	2.2 m
06A806	BZ15	1+21 9	107+51.9	2.2 m

Field Density Testing

Field density tests on the asphalt concrete layer were performed to determine field compaction at locations indicated in the figures 3 and 4. The location and density test results are presented in table 12.

Table 12. Asphalt concrete in-place densities, SPS-A8 California.

Section	Project Station	Section Station	C/L Reference (meters)	Average In-Situ Density (T/M^3)	Average In-Situ Air Voids (%)
06A805	104+10.5	0+30.5	2.1	2.19	4 0
	104+56.2	0+76.2	2.1	2.19	3.8
	105+01.9	1+21.9	2.1	2.16	4.0
06A806	106+60.5	0+30.5	2 1	2.16	4 7
	107+06.2	0+76.2	2.1	2.17	4 6
	107+51.9	1+21.9	2.1	2.20	4.6

Finished AC Surface Elevations

Elevation surveys of finished AC surface were performed at locations indicated in figure 5. The purpose of the elevation surveys is to obtain the as-built thickness profile of AC surface. The AC elevation profiles of test sections are presented in figure 10. The as-built thicknesses of AC layer are enumerated in table 13.

Table 13. As-built AC layer average thickness (mm), SPS-A8 California.

Section Station	Section 06A805	Section 06A806
0+00.0	90	189
0+15.25	95	185
0+30.50	95	191
0+45.75	101	192
0+61.00	106	192
0+76 20	93	192
0+91.45	93	182
1+06.70	93	190
1+21.95	91	190
1+37.20	78	181
1+52.40	77	183
Average	92	188

FWD Testing of AC Surface

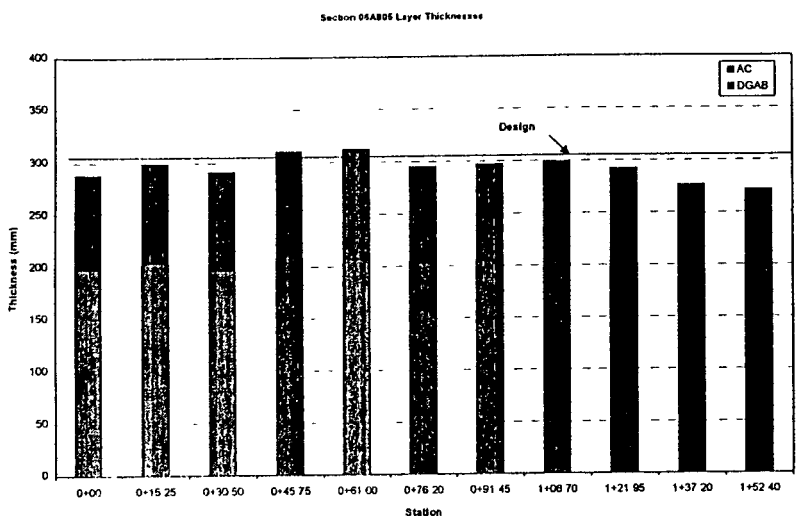
Falling Weight Deflectometer (FWD) testing on the finished AC surface was carried out on November 4 and 5, 1999 for sections 06A805 and 06A806 in accordance with the procedures given in the LTPP FWD Operator's Manual. Midlane deflection profiles of AC layer are given in figures 11 and 12. These figures indicate the last 30m of A805 is a bit stiffer than the rest and that there are no significant differences in A806. The loads plotted for sections A805 and A806 were approximately 580 kPa for each.

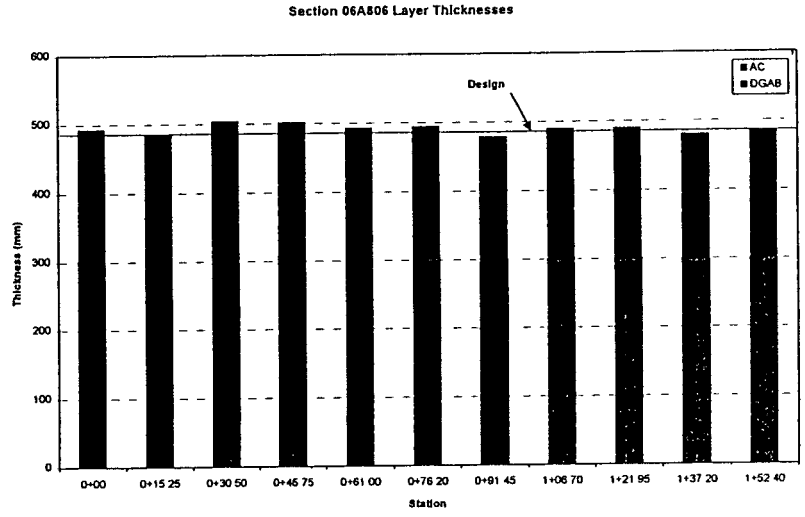
SHOULDER AUGER DRILLING

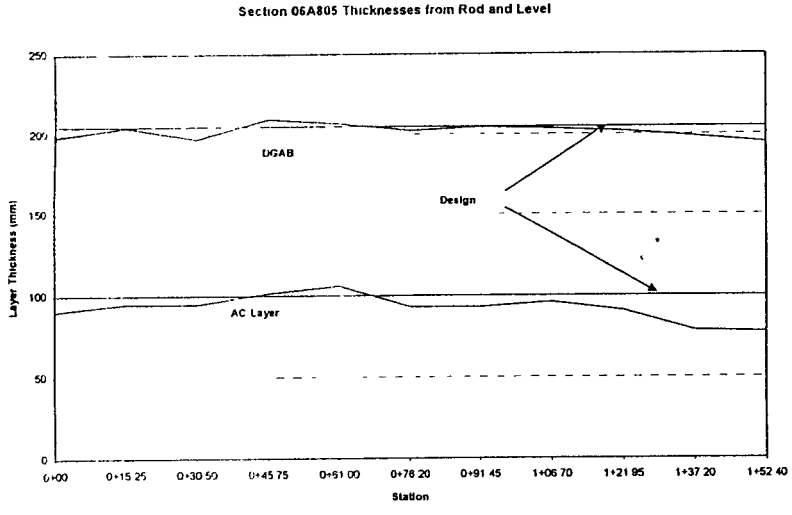
Shoulder auger drilling to a depth of 6.0m was performed on April 18, 2000 to determine the existence of bedrock or any stiff underlying layer within 20ft.of pavement surface for section 06A806. No rock or stiff layer was encountered within the drilled depth. Shoulder probe drilling for section 06A805 was not performed because of the presence of overhead power lines that were likely to snag with the drilling rig. The shoulder auger probe was located at section station 0+00 instead of 0+76.2 as marked in the California SPS-8 materials sampling and testing plan for section 06A806. The soil profile recorded during the auger drilling of section 06A806 is presented in table 14.

Table 14. Soil profiles and soil types, SPS-A8 California.

Test No.	Section	Project Station	Section Station	Offset	Type of Equipment Used	Depth of Layer (m)	Material Description
D2	06A806	106+03	0+00	1.8 m right of lane edge	CME 75	0 to 0.75	Brown damp fine sand
						0 75 to 1.8	Brown damp fine sand
						1.8 to 5.0	Brown to tan damp fine sand
						5.0 to 6 0	Brown wet fine clayey sand







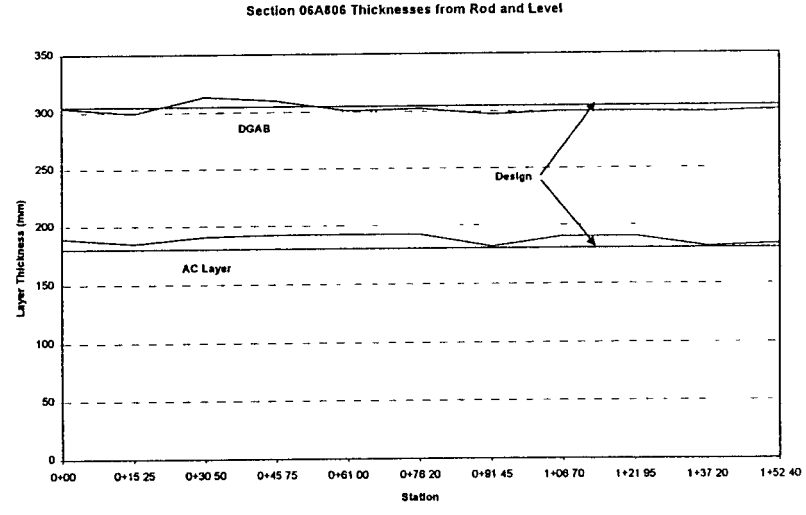


Figure 10. DGAB and AC layer thicknesses.

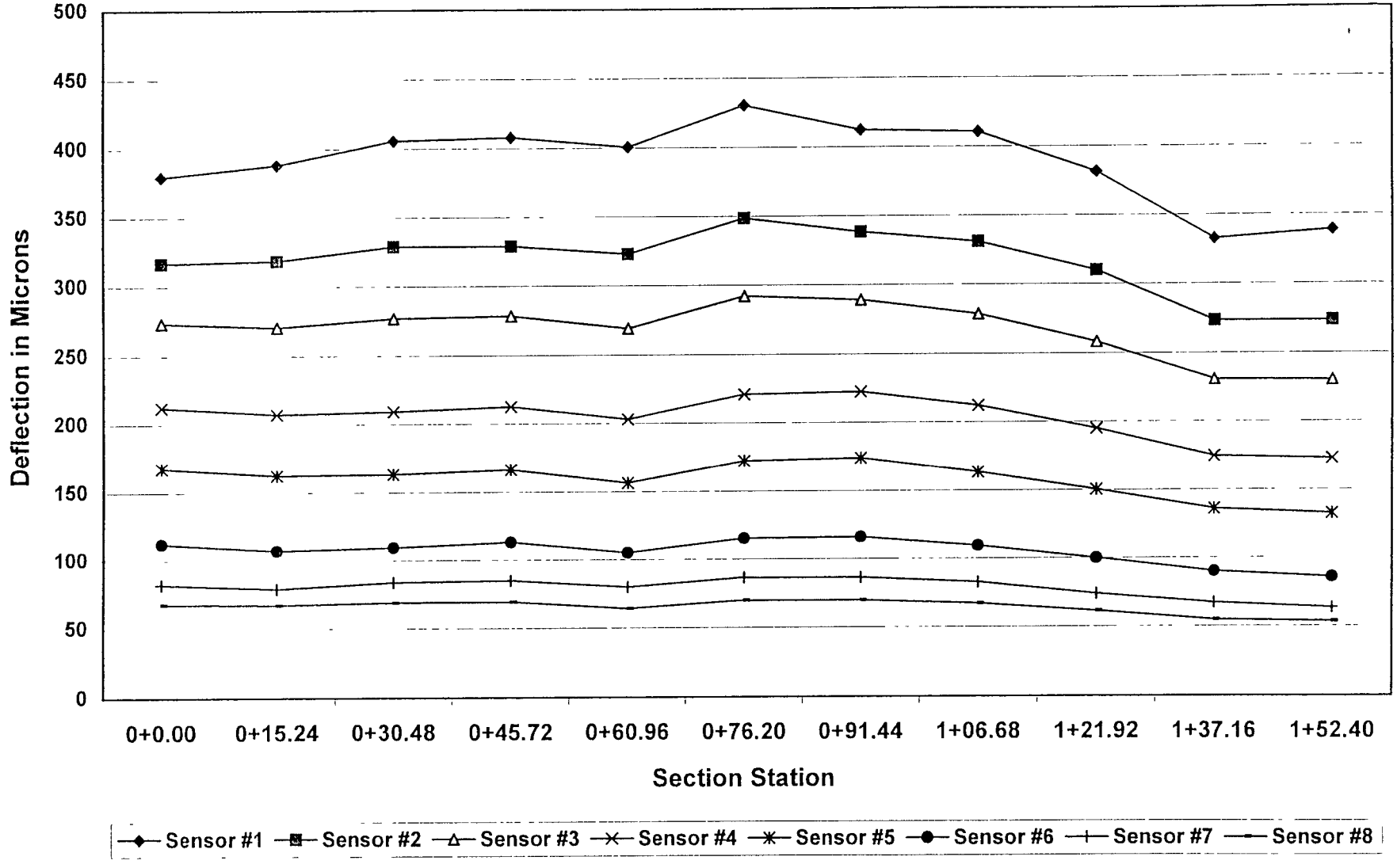


Figure 11. AC deflection profile, section 06A805.

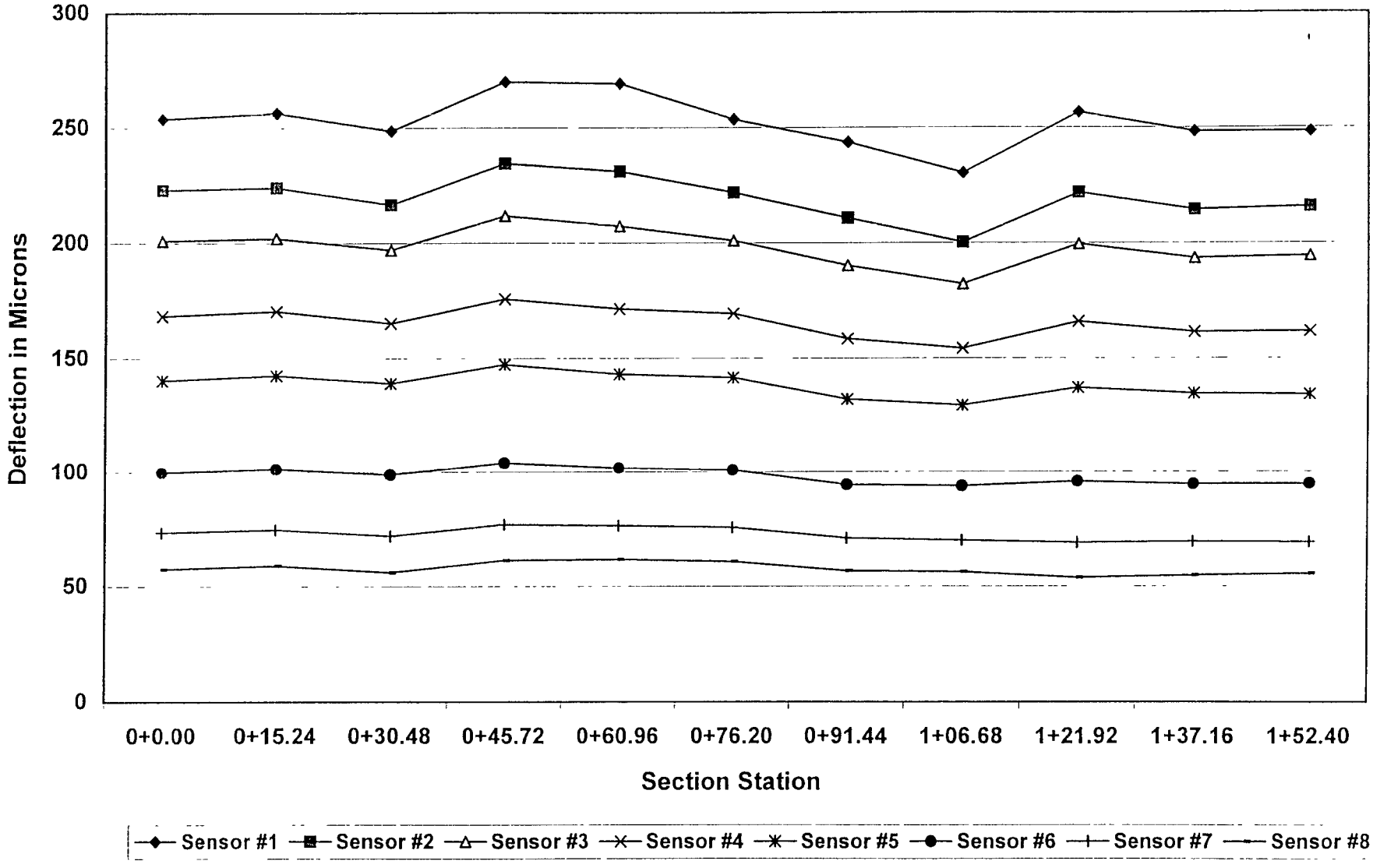


Figure 12. AC deflection profile, section 06A806.

IV. SUMMARY

Construction of the LTPP SPS-8, "Strategic Study of Environmental Factors in the Absence of Heavy Loads" experimental study project was carried out on the northbound lane of Sycamore Street, frontage road for US99 at Delhi, 18 miles (29Km) south of Modesto, California. Two asphalt concrete sections having different base and surface course thicknesses were built under the study. Construction began in May 1999 and the paving operations were completed on September 30, 1999.

Prepared subgrade construction work began in May 1999 and was completed on September 12, 1999.

Dense graded aggregate base construction work began on September 13, 1999 and was completed on September 17, 1999.

AC paving began on September 27, 1999 and was completed on September 29, 1999. Post construction FWD testing for all the pavement layers was performed by WRCOC before the placement of subsequent layer.

Overall there were no major problems during any phase of construction of this project. Some minor problems that were observed are recorded in section V.

V. KEY OBSERVATIONS

Key observations within each layer will be discussed in this section.

SUBGRADE

No deviations or problems were observed that could affect the performance of the subgrade.

DENSE GRADED AGGREGATE BASE (DGAB)

Generally the dense graded aggregate base construction went well without any problems. There were no deviations recorded for this layer.

ASPHALT CONCRETE (AC)

The asphalt concrete construction began on September 27, 1999 and was completed on September 29, 1999. There were some pick up problems with the pneumatic wheeled roller on the first day of paving operations, which did not happen during the next paving day. There were some screed marks on the finished AC pavement surface.

APPENDIX A

CALIFORNIA SPS-A8 CONSTRUCTION PHOTOGRAPHS

APPENDIX A - CALIFORNIA SPS-8 CONSTRUCTION PHOTOS

Appendix A consists of the following construction photos:

Photo 1. Subgrade material.
Photo 2. Grading of subgrade.
Photo 3. Finished subgrade.
Photo 4. FWD testing on subgrade.
Photo 5. Aggregate bins for AC.
Photo 6. Hot-mix plant.
Photo 7. AC windrow on DGAB.
Photo 8. Checking the ski on AC paver.
Photo 9. Pneumatic roller.
Photo 10. Pickup of AC by pneumatic rolller.
Photo 11. AC sampling.
Photo 12. Second (final) AC lift.

Photo 1. Subgrade material.

Photo 2. Grading of subgrade.

Photo 3. Finished subgrade.

Photo 4. FWD testing on subgrade.

Photo 5. Aggregate bins for AC.

Photo 6. Hot-mix plant.

Photo 7. AC windrow on DGAB.

Photo 8. Checking the ski on AC paver.

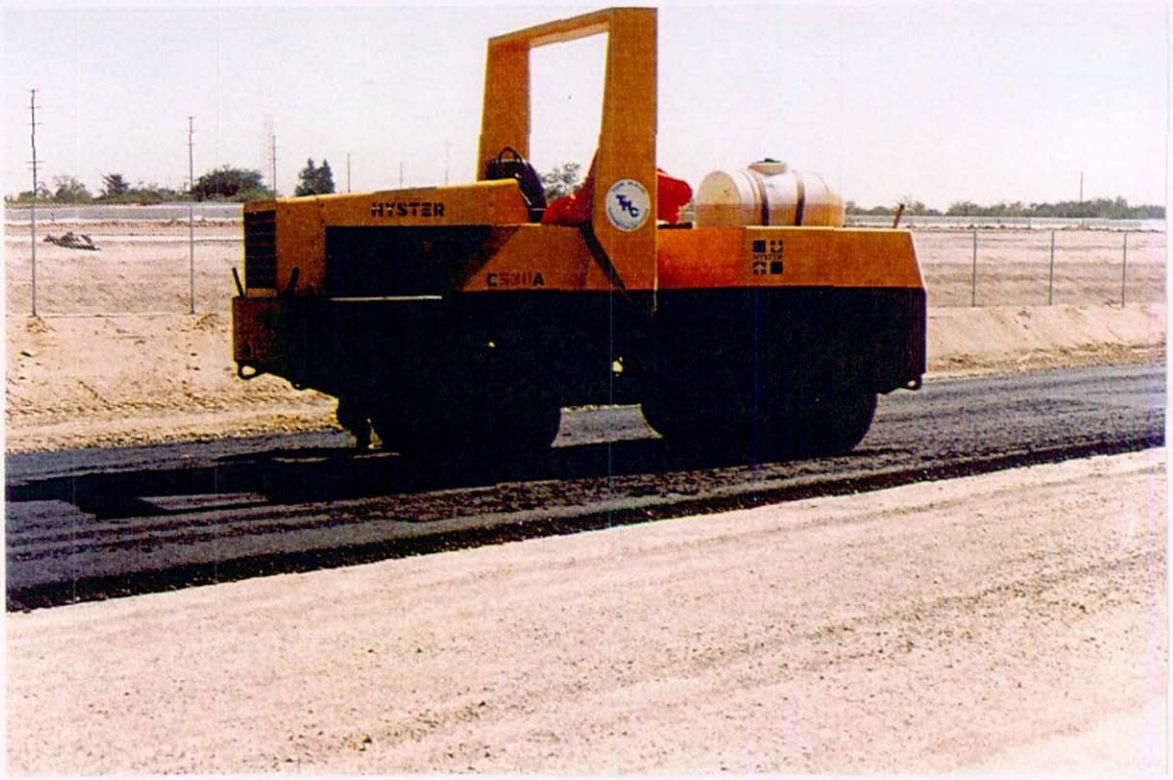


Photo 9. Pneumatic roller.

Photo 10. Pickup of AC by pneumatic roller.

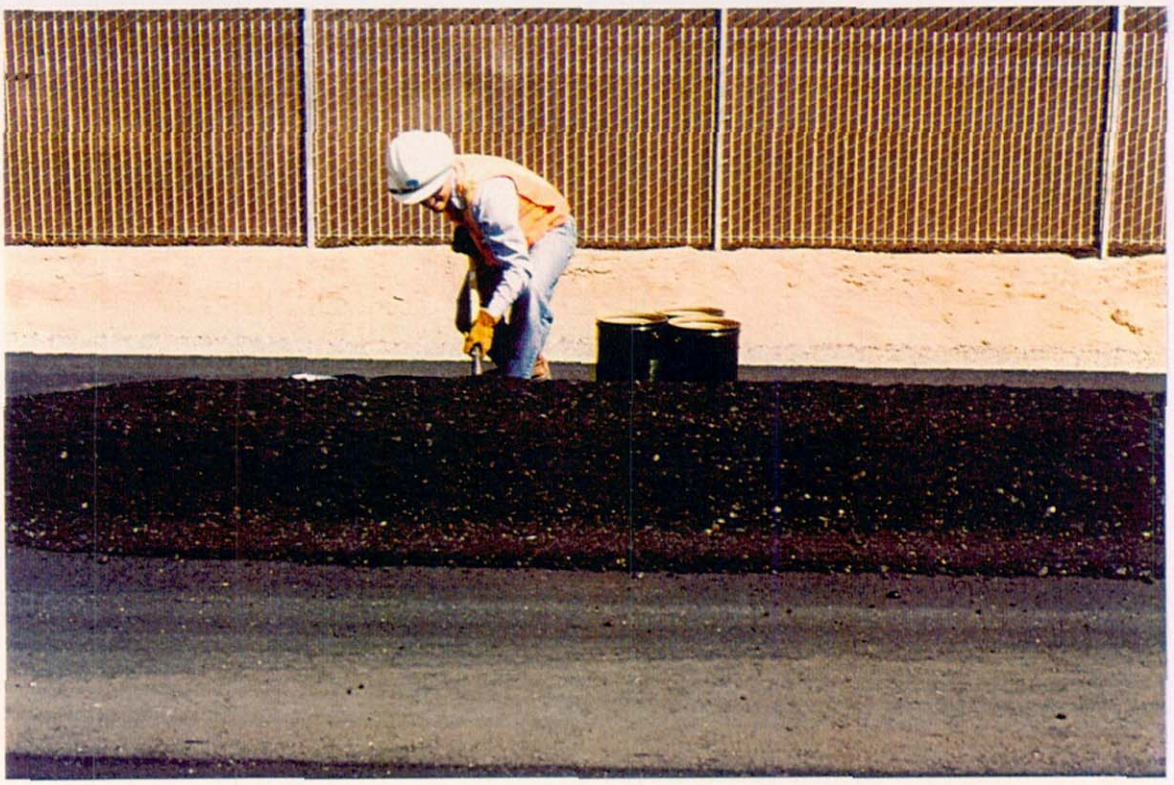


Photo 11. AC sampling.

Photo 12. Second (final) AC lift.

APPENDIX B

CALIFORNIA SPS-8 MIX DESIGN

SIGNET
Testing Labs

July 1, 1999

REPORT NO: S3841 STL NO.: 0006805

REPORT TO: SANTA FE AGGREGATES
BILL BROWN
436 MITCHELL ROAD
PO BOX 3042
MODESTO, CA 95353

PROJECT: Caltrans Contract No. 10-0437U4

SUBJECT: 19.0 mm Maximum Medium Type B Asphalt Concrete Mix Design

Mr. Brown :

On June 28, 1999, samples of aggregate and asphalt were submitted to our laboratory for a 3/4" Maximum Medium Type B Hveem asphalt concrete mix design. The asphalt cement is San Joaquin Refinery AR 4000. The hot bin aggregate samples are from the Santa Fe Aggregates, Winton, asphalt plant.

The mix design was performed in accordance current Caltrans methods. Samples of the aggregate and asphalt cement were mixed at 285 degrees F and compacted at 230 degrees F. Per your request of 5 percent air voids, the optimum oil content is 5.25 % by weight of aggregate. The results of our analysis are attached.

The data generated for this mix design represents only the results of tests on specific samples of aggregate and asphalt cement submiited to our laboratory by Santa Fe Aggregates. No other warranty, express or implied, is made.

SIGNET TESTING LABORATORIES is accredited with the American Association of State Highway and Transportation Officials (AASHTO) for Hot Mix Asphalt and Hot Mix Asphalt Aggregates. Signet's laboratory is in compliance with ASTM E-329 and D-3666 "Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials."

Should you have any questions, please call me at (510) 887-8484.

Sincerely,

Signet Testing Laboratories
Respectfully submitted,
SIGNET TESTING LABORATORIES, INC.

William Rodriguez
Lab Manager, NICET Level IV #[illegible]

/wr

cc: SANTA FE AGGREGATES/BILL BROWN
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06A800 AC

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SIGNET Testing Labs

REPORT NO: S3841
PROJECT: MISC LAB TESTING
DATE: July 6, 1999
PAGE NO: 2 of 4

GRADING ANALYSIS
3/4" Maximum Medium Type B Asphalt Concrete
Hwy 99, Winton, Caltrans Contract No. 10-0437U4
Plant : Santa Fe Aggregates, Winton
Asphalt : San Joaquin Refinery, AR 4000

Sieve	Sieve	Bin 4		Bin 3		Bin 2		Bin 1	
Size	Size	%pass	%used	%pass	%used	%pass	%used	%pass	%used
25-mm	1"	100 0	10 0	100.0	22.0	100.0	25.0	100.0	43.0
19-mm	3/4"	79.6	8 0	100.0	22.0	100.0	25.0	100.0	43.0
12.5-mm	1/2"	7 9	0 8	81 2	17 9	100 0	25.0	100 0	43.0
9 5-mm	3/8"	4.2	0 4	23.2	5.1	97.3	24.3	100.0	43.0
4.75-mm	#4	2.8	0 3	0.8	0.2	35.6	8 9	99.0	42.6
2.36-mm	#8	2.5	0 3	0 6	0.1	2.2	0.6	81.2	34.9
1 18-mm	#16	2.5	0 3	0 6	0.1	0 4	0.1	61 5	26.4
600-um	#30	2.5	0 3	0.6	0.1	0.3	0.1	45 7	19.7
300-um	#50	2.5	0 3	0.6	0.1	0.3	0.1	26.6	11 4
150-um	#100	2.5	0 3	0.6	0.1	0.3	0.1	11 7	5 0
75-um	#200	2.5	0 3	0.6	0.1	0.2	0.1	5.3	2.3

COMBINED AGGREGATE GRADATION

Sieve	Sieve	Percent		T-Value		Production	
Size	Size	Passing	T Value	Limits	Tolerances	Limits	PASS/FAIL
25 0 mm	1"	100	100	100	0	100	PASS
19 0 mm	3/4"	98	95	90-100	+/-5	90-100	PASS
12 5 mm	1/2"	87					PASS
9 5 mm	3/8"	73	73	65-80	+/-6	66-79	PASS
4 75 mm	#4	52	52	49-54	+/-7	45-59	PASS
2 36 mm	#8	36	36	36-40	+/-6	30-42	PASS
1 18 mm	#16	27				—	—
600 um	#30	20	20	18-21	+/-4	16-24	PASS
300 um	#50	12				—	—
150 um	#100	5				—	—
75 um	#200	3	3	3-8	+/-2	1-5	PASS

Agg Sp.

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SIGNET Testing Labs

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AGGREGATE QUALITY TESTS

	Result	Spec	Pass/Fail
Percent Crushed Particles (2 face) CTM 205			
Coarse	98	25 min	PASS
Fine	99	20 min	PASS
LA Rattler CTM 211			
100 revs	6	—	PASS
500 revs	27	50 max	PASS
Sand Equivlaent CTM 217	78	42 min	PASS
CKE CTM 303			
CKE Coarse (%)	2.6	—	—
CKE Fine (%)	2.5	—	—
Kc Factor	1.1	1.7 max	PASS
Kf Factor	1.1	1.7 max	PASS
Km Factor	1.1	—	—
Surface Area	21	—	—
Coarse Specific Gravity CTM 206 (g/cc)	2.620	—	—
Fine Specific Gravity CTM 208 (g/cc)	2.690	—	—
Average Aggregate Specific Gravity (g/cc)	2.656	—	—

SPECIMEN DATA

SPECIMEN IDENTIFICATION	A	B	C	D
% AC BY WEIGHT OF AGGREGATE	4.3	4.8	5.3	5.8
BULK SPECIFIC GRAVITY (g/cc)	2.299	2.315	2.342	2.354
BULK UNIT WEIGHT (pcf)	143.1	144.1	145.7	146.5
MAXIMUM SPECIFIC GRAVITY (CA 367)	2.491	2.474	2.458	2 441
MAXIMUM UNIT WEIGHT (CA 367)	155.0	154.0	153.0	151.9
% VOIDS - TOTAL MIX (CA 367)	7.7	6.4	4.7	3.6
STABILITY VALUE	45	42	41	37
FLUSHING	NO	NO	NO	NO

HMA MIX PROPERTIES AT OPTIMUM ASPHALT CONTENT

	Result	Spec	PASS/FAIL
Optimum Asphalt Content (per 100 agg.)	5.25%	—	—
Compacted Density g/cc CTM 308	2.341	—	—
Maximum Theoretical Dens CTM 367	2.459	—	—
Percent Air Voids CTM 367	4.8	3-5	PASS
Stabilometer Value CTM 366	41	35 min	PASS
Swell CTM 305 (mm)	0.00	0.76 max	PASS

Agree H

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SIGNET Testing Labs

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PROJECT: MISC LAB TESTING
DATE: July 6, 1999
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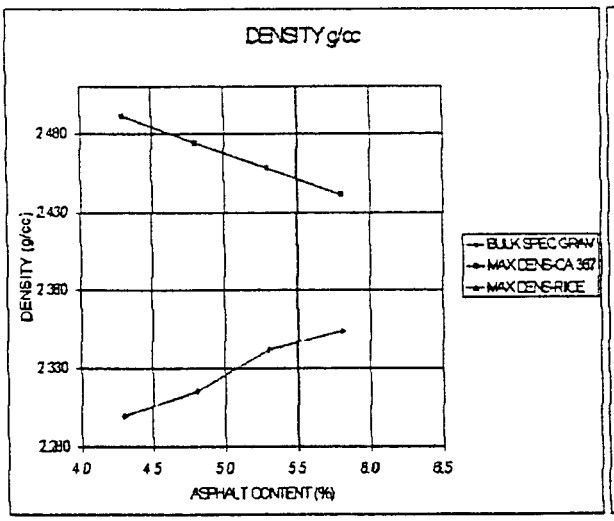

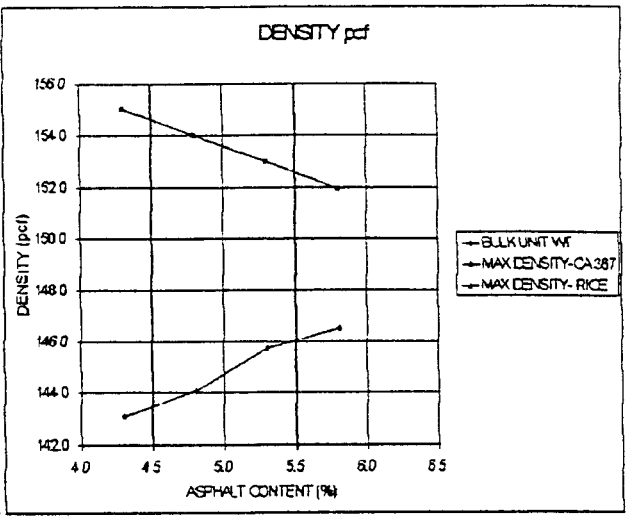

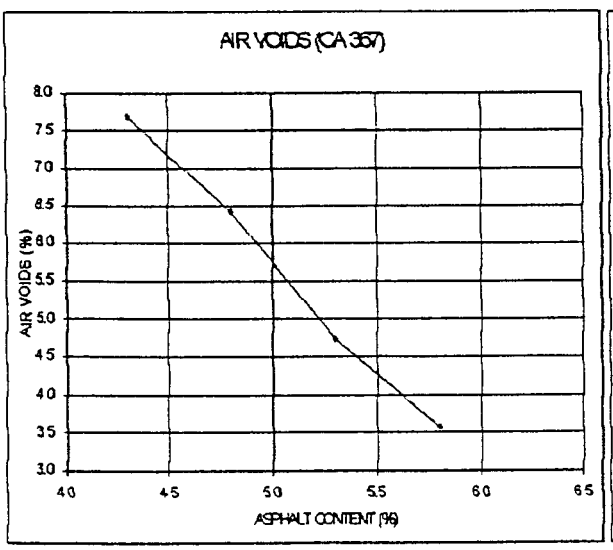

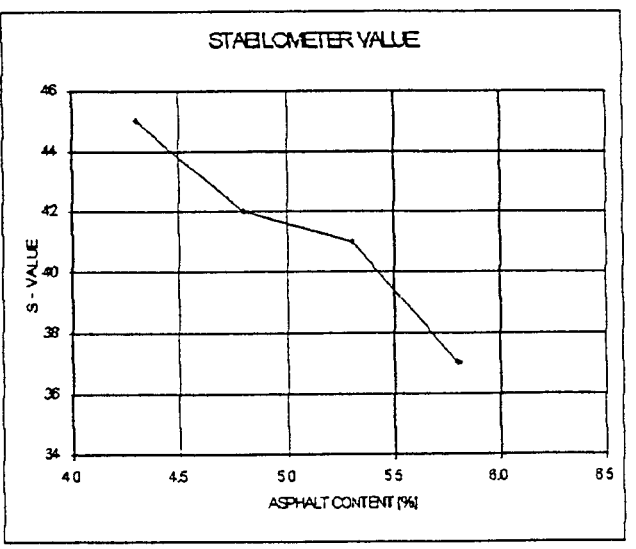

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APPENDIX C

CALIFORNIA SPS-8 SAMPLING PLAN

Table 1. Field and laboratory test plan for **Natural Subgrade** materials, SPS-8 California.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Sieve Analysis	SS01	Ship to FHWA Lab[1]	4	BZ1-BZ4
Hydrometer to 0.01mm	SS02	Ship to FHWA Lab[1]	4	BZ1-BZ4
Atterberg Limits	SS03	Ship to FHWA Lab[1]	4	BZ1-BZ4
Classification & Type of Subgrade	SS04	Ship to FHWA Lab	4	BZ1-BZ4
Moisture-Density Relations	SS05	Ship to FHWA Lab[1]	4	BZ1-BZ4
Resilient Modulus	SS07	Ship to FHWA Lab[1]	4	BZ1-BZ4
Natural Moisture Content	SS09	Ship to FHWA Lab[1]	4	BZ1-BZ4
Permeability	SS11/UG09	P48	1	BZ2
In-Place Density		SHRP-LTPP Method	16	TZ1-TZ16

[1]Ship to FHWA lab after splitting and quartering a 45 kg sample for the state testing.

Table 2. Field and laboratory test plan for **Prepared Embankment** materials

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Sieve Analysis	SS01	Ship to FHWA Lab[1]	4	BZ5-BZ8
Hydrometer to 0.01mm	SS02	Ship to FHWA Lab[1]	4	BZ5-BZ8
Atterberg Limits	SS03	Ship to FHWA Lab[1]	4	BZ5-BZ8
Classification & Type of Subgrade	SS04	Ship to FHWA Lab[1]	4	BZ5-BZ8
Moisture-Density Relations	SS05	Ship to FHWA Lab[1]	4	BZ5-BZ8
Resilient Modulus	SS07	Ship to FHWA Lab[1]	4	BZ5-BZ8
Natural Moisture Content	SS09	Ship to FHWA Lab[1]	4	BZ5-BZ8
Permeability	UG09	P48	1	BZ6
In-Place Density		LTPP Method	16	TZ17,TZ32
Depth to Rigid Layer		LTPP Method	4	DZ1-DZ4
Expansion Index	SS12	P60	40	DZ1-DZ4

[1]Ship to FHWA lab after splitting and quartering a 45 kg sample for the state testing.

Table 3. Field and laboratory test plan for **Class 2 Aggregate Base** materials.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Particle Size Analysis	UG01	Ship to FHWA lab[1]	4	BZ9-BZ12
Sieve Analysis (washed)	UG02	Ship to FHWA lab[1]	4	BZ9-BZ12
Atterberg Limits	UG04	Ship to FHWA lab[1]	4	BZ9-BZ12
Moisture-Density Relations	UG05	Ship to FHWA lab[1]	4	BZ9-BZ12
Resilient Modulus	UG07	Ship to FHWA lab[1]	4	BZ9-BZ12
Classification	UG08	Ship to FHWA lab[1]	4	BZ9-BZ12
Permeability	UG09	P48	1	BZ11
Natural Moisture Content	UG10	Ship to FHWA lab[1]	4	BZ9-BZ12
In-Place Density		SHRP-LTPP Method	16	TZ33-TZ48

[1]Ship to FHWA lab after splitting and quartering a 45 kg sample for the state testing.

Table 4. Field and laboratory test plan for **Asphalt Concrete** surface materials.

Test Name	SHRP Test Designation	SHRP Protocol	No. of Tests	Material Source/ Test Location
Core Examination/Thickness	AC01	P01	3	CZ10-CZ12
Bulk Specific Gravity	AC02	P02	3	CZ10-CZ12
Maximum Specific Gravity	AC03	P03	3	BZ13-BZ15 from Paver
Asphalt Content (Extraction)	AC04	P04	3	BZ13-BZ15 from Paver
Moisture Susceptibility	AC05	P05	3	BZ13-BZ15 from Paver
Creep Compliance	AC06	Ship to FHWA lab	1	CZ9
Resilient Modulus	AC07	Ship to FHWA lab	9	CZ1-CZ3,CZ5-CZ7,CZ13-CZ15
Indirect Tensile Strength	AC07	Ship to FHWA lab	3	CZ4,CZ8,CZ16
In-Place Density		SHRP-LTPP Method	6	TZ49-TZ54
Asphalt Cement				
Abson Recovery	AE01	P21	3	BZ13-BZ15 from Paver
Penetration @ 25°C, 46.1°C	AE02	P22	3	BZ13-BZ15 from Paver
Specific Gravity @ 15.6°C	AE03	P23	3	BZ13-BZ15 from Paver
Viscosity @ 25°C	AE04	P24	3	BZ13-BZ15 from Paver
Viscosity @60°C, 135°C	AE05	P25	3	BZ13-BZ15 from Paver
Extracted Aggregate				
Specific Gravity of Coarse Aggregate	AG01	P11	3	BZ13-BZ15 from Paver
Specific Gravity of Fine Aggregate	AG02	P12	3	BZ13-BZ15 from Paver
Aggregate Gradation	AG04	P14	3	BZ13-BZ15 from Paver
NAA Test for Fine Aggregate Particle Shape	AG05	P14A	3	BZ13-BZ15 from Paver
Asphalt Cement (from plant)				
Penetration @ 25°C, 46.1°	AE02	P22	3	BCZ13-BCZ15 from Plant
Specific Gravity @ 15.6°C	AE03	P23	3	BCZ13-BCZ15 from Plant
Vicosity @ 25°C	AE04	P24	3	BCZ13-BCZ15 from Plant
Viscosity @ 60°C, 135°C	AE05	P25	3	BCZ13-BCZ15 from Plant
Asphalt cement samples (three 19-1 pails)	Storage	Ship to MRL[1]	50-1	Mix Plant
Aggregate samples (one 200-1 drum)	Storage	Ship to MRL[1]	220 kg	Mix Plant
Bulk asphalt concrete mixture samples (three 19-1 pails)	Storage	Ship to MRL[1]	90 kg	Roadway

[1]Containers and shipping will be provided by FHWA.

APPENDIX D

CALIFORNIA SPS-8 CONSTRUCTION DATA FORMS

SPS-8 CONSTRUCTION DATA SHEET 1 PROJECT IDENTIFICATION	* STATE CODE [06] * SPS PROJECT CODE [A8] * TEST SECTION NO. [00]

*1. DATE OF DATA COLLECTION OR UPDATE (Month/Year) [__/__]

*2. STATE HIGHWAY AGENCY (SHA) DISTRICT NUMBER [10.]

*3. COUNTY OR PARISH [_47.]

4. FUNCTIONAL CLASS (SEE TABLE A.2, APPENDIX A) [09.]

*5. ROUTE SIGNING (NUMERIC CODE) [4.]
Interstate... 1 U.S.... 2 State... 3
Other... 4

*6. ROUTE NUMBER [_____.]

7. TYPE OF PAVEMENT (01 for Granular Base, 02 for Treated Base) [~~17~~ 01.]

8. NUMBER OF THROUGH LANES (ONE DIRECTION) [1.]

*9. DATE OF CONSTRUCTION COMPLETION (Month/Year) [07/99]

*10. DATE OPENED TO TRAFFIC (Month/Year) [11/99]

11. CONSTRUCTION COSTS PER LANE MILE (In $1000) [___70.]

12. DIRECTION OF TRAVEL [3.]
East Bound... 1 West Bound... 2 North Bound... 3
South Bound... 4

PROJECT STARTING POINT LOCATION

*13. MILEPOINT [_32.60]

*14. ELEVATION [__118]

*15. LATITUDE [37°25'25.74"]

*16. LONGITUDE [120°46'09.84"]

17. ADDITIONAL LOCATION INFORMATION (SIGNIFICANT LANDMARKS): [_____
_____
_____]

18. HPMS SAMPLE NUMBER (HPMS ITEM 28) [_____]

19. HPMS SECTION SUBDIVISION (HPMS ITEM 29) [_.]

ENT'D JUN 01 2001

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 2 GEOMETRIC, SHOULDER AND DRAINAGE INFORMATION	* STATE CODE [04] * SPS PROJECT CODE [A8] * TEST SECTION NO. [02]

*1. LANE WIDTH (FEET) [12.]

2. MONITORING SITE LANE NUMBER [1.]
(LANE 1 IS OUTSIDE LANE, NEXT TO SHOULDER
LANE 2 IS NEXT TO LANE 1, ETC.)

*3. SUBSURFACE DRAINAGE LOCATION [3.]
Continuous Along Test Section... 1 Intermittent... 2 None... 3

*4 SUBSURFACE DRAINAGE TYPE [1.]
No Subsurface Drainage... 1 Longitudinal Drains... 2
Transverse Drains... 3 Drainage Blanket.. 4 Well System... 5
Drainage Blanket with Longitudinal Drains... 6
Other (Specify)... 7 _____

SHOULDER DATA	INSIDE SHOULDER	OUTSIDE SHOULDER
*5. SURFACE TYPE Turf... 1 Granular.... 2 Asphalt Concrete... 3 Concrete... 4 Surface Treatment... 5 Other (Specify)... 6 _____	[N.]	[3.]
*6. TOTAL WIDTH (FEET)	[__N.]	[__4.]
*7. PAVED WIDTH (FEET)	[__N.]	[__4.]
8. SHOULDER BASE TYPE (CODES-TABLE A.6)	[__N.]	[23.]
9. SURFACE THICKNESS (INCHES)	[__ __.N]	[__ __. __]
10. SHOULDER BASE THICKNESS (INCHES)	[__ __.N]	[__ __. __]
11. DIAMETER OF LONGITUDINAL DRAINPIPES (INCHES)		[__.N]
12. SPACING OF LATERALS (FEET)		[__ __N.]

06A805 8.1" 3.9"
06A806 12.0" 7.1"

ENTD JUN 01 2001

PREPARER Jason Purcinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 3 REFERENCE PROJECT STATION TABLE	• STATE CODE (06) • SPS PROJECT CODE (A805) • TEST SECTION NO (02)

ORDER	*1 TEST SECTION ID NO	REFERENCE PROJECT STATION NUMBER		*4 CUT-FILL TYPE
		*2 START	*3 END	
1	06A805	0+00	1+52	~~3~~ 2
2	06A806	2+50	4+02	~~3~~ 2
3		+	+	
4		+	+	
5		+	+	
6		+	+	
7		+	+	
8		+	+	
9		+	+	
10		+	+	
11		+	+	
12		+	+	
13		+	+	
14		+	+	
15		+	+	
16		+	+	
17		+	+	
18		+	+	
19		+	+	
20		+	ENT'D JUN 01 2001	

*5 INTERSECTIONS BETWEEN TEST SECTION ON THE PROJECT

ROUTE	PROJECT STATION NO.	RAMPS EXIT	RAMPS ENT	INTERSECTION STOP	INTERSECTION SIGNAL	INTERSECTION UNSIG
	+__					
	+__					
	+__					

Note 1. Indicate the type of subgrade construction the test section is located on:
Cut... 1 Fill... 2 At-Grade... 3 Cut, Fill, and At-Grade Combo... 4

If a section contains any combination of cut, fill and at-grade portions (code 4 above), enter the specific details of the cut, fill and at-grade locations on SPS-8 Construction Data Sheet 15.

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [04] * SPS PROJECT CODE [A8] * TEST SECTION NO. [05]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[58]	[redacted]	[redacted]	[redacted]	[redacted]
2	[05]	[23]	[8.2]	7.2	9.4	0.4
3	[03]	[01]	[4.2]	3.5	5.0	0.3
4	[ ]	[ ]	[.]	.	.	.
5	[ ]	[ ]	[.]	.	.	.
6	[ ]	[ ]	[.]	.	.	.
7	[ ]	[ ]	[.]	.	.	.
8	[ ]	[ ]	[.]	.	.	.
9	[ ]	[ ]	[.]	.	.	.
10	[ ]	[ ]	[.]	.	.	.
11	[ ]	[ ]	[.]	.	.	.
12	[ ]	[ ]	[.]	.	.	.
13	[ ]	[ ]	[.]	.	.	.
14	[ ]	[ ]	[.]	.	.	.
15	[ ]	[ ]	[.]	.	.	.

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (FEET) (Rock, Stone, Dense Shale) ENT'D JUN 01 2001 [.]

NOTES:

1. Layer 1 is the subgrade soil, the highest numbered layer is the pavement surface.

2. Layer description codes:

Overlay 01	Base Layer.....05	Porous Friction Course..09
Seal/Tack Coat.....02	Subbase Layer.. .06	Surface Treatment.....10
Original Surface.....03	Subgrade..... . 07	Embankment (Fill).....11
HMAC Layer (Subsurface).04	Interlayer.....08	

3. The material type classification codes are presented in Tables A.5, A.6, A.7 and A.8 of the Data Collection Guide for Long Term Pavement Performance Studies, dated January 17, 1990.

4. Enter the average thickness of each layer and the minimum, maximum and standard deviation of the thickness measurements, if known.

SPS-8 CONSTRUCTION DATA SHEET 5 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* STATE CODE [0 6] * SPS PROJECT CODE [A 8] * TEST SECTION NO. [0 5]

*1 LAYER NUMBER (FROM SHEET 4) [3]

	COMPOSITION OF COARSE AGGREGATE	TYPE	PERCENT
*2.	Crushed Stone... 1 Gravel... 2 Crushed Gravel... 3	[3]	[100.]
*3.	Crushed Slag... 4 Manufactured Lightweight... 5	[__]	[___.]
*4.	Other (Specify)... 6 _____	[__]	[___.]
	COMPOSITION OF FINE AGGREGATE	TYPE	PERCENT
*5.	Natural Sand... 1	[1]	[100.]
*6.	Crushed or Manufactured Sand (From Crushed Gravel or	[__]	[___.]
*7.	Stone... 2 Recycled Concrete... 3 Other (Specify)... 4 _____	[__]	[___.]

*8. TYPE OF MINERAL FILLER [N]
Stone Dust... 1 Hydrated Lime... 2 Portland Cement... 3
Fly Ash... 4
Other (Specify)... 5 _____

BULK SPECIFIC GRAVITIES. 2.620

*9. Coarse Aggregate (AASHTO T85 or ASTM C127) [~~2.700~~]

*10. Fine Aggregate (AASHTO T84 or ASTM C128) [~~2.740~~] 2.690

*11. Mineral Filler (AASHTO T100 or ASTM D854) [__.__N]

*12. Aggregate Combination (Calculated) [2.656]

13. Effective Specific Gravity of Aggregate Combination (Calculated) [2.659]

AGGREGATE DURABILITY TEST RESULTS
(SEE DURABILITY TEST TYPE CODES, TABLE A.13)

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
14.	Coarse	[__N]	[___.__N]
15.	Coarse	[__N]	[___.__N]
16.	Coarse	[__N]	[___.__N]
17.	Coarse and Fine - Combined	[__N]	[___.__N]

18. POLISH VALUE OF COARSE AGGREGATES
SURFACE LAYER ONLY (AASHTO T279, ASTM D3319) ENT'D JUN 01 2001 — N.

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 6 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE [0 6] * SPS PROJECT CODE [A 8] * TEST SECTION NO [0 5]

*1. LAYER NUMBER (FROM SHEET 4) [3]

*2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [0 9]
(IF OTHER, SPECIFY) _____

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [1 8]
(IF OTHER, SPECIFY) _____

4. SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T228) [~~1.010~~ 1.028]

GENERAL ASPHALT CEMENT PROPERTIES (If available from supplier)

5. VISCOSITY OF ASPHALT AT 140°F (POISES) (AASHTO T202) [_ _ 1865.]

6. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) (AASHTO T202) [_ 239.33]

7. PENETRATION AT 77°F (AASHTO T49) (TENTHS OF A MM) (100 g., 5 sec.) [_ _ _ 6.]

ASPHALT MODIFIERS (SEE TYPE CODE, A 15)

		TYPE	QUANTITY (%)
8.	MODIFIER #1	[_ N]	[_ N.]
9.	MODIFIER #2 (IF OTHER, SPECIFY) _____	[_ N]	[_ N.]

10. DUCTILITY AT 77°F (CM) (AASHTO T51) [_ _ _.]

11. DUCTILITY AT 39.2°F (CM) (AASHTO T51) [_ _ _.]

12. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°f (CM/MIN) [_ _ _.]

13. PENETRATION AT 39.2°F (AASHTO T49) (TENTHS OF A MM) (200 g., 60 sec.) [_ _ _.]

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [_ _ _.]

NOTE: If emulsified or cutback asphalt was used, enter "N" in the spaces for "Original Asphalt Cement Properties".

ENT'D JUN 01 2001

PREPARER Jason Purcell EMPLOYER NLE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 7 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [04] * SPS PROJECT CODE [A8] * TEST SECTION NO [05]

*1. LAYER NUMBER (FROM SHEET 4) [3]

*2. TYPE OF SAMPLES [__]
SAMPLES COMPACTED IN LABORATORY .. 1
SAMPLES TAKEN FROM TEST SECTION... 2

*3. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) [2.471]
(AASHTO T209 OR ASTM D2041)

BULK SPECIFIC GRAVITY (ASTM D1188)

*4. MEAN [__.__ __ __] NUMBER OF TESTS [__ __.]

5. MINIMUM [__.__ __ __] MAXIMUM [__.__ __ __]

6. STD. DEV. [__.__ __ __]

ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX)
(AASHTO T164 OR ASTM D2172)

*7. MEAN [4.867] NUMBER OF SAMPLES [03]

8. MINIMUM [4.800] MAXIMUM [4.900]

9. STD. DEV. [0.058]

PERCENT AIR VOIDS

*10. MEAN [__.__ __ __] NUMBER OF SAMPLES [__ __.]

11. MINIMUM [__.__ __ __] MAXIMUM [__.__ __ __]

12. STD. DEV. [__.__ __ __]

*13. VOIDS IN MINERAL AGGREGATE (PERCENT) [__ __.__]

*14. EFFECTIVE ASPHALT CONTENT (PERCENT) [__ __ __]

*15. MARSHALL STABILITY (LBS) (AASHTO T245 OR ASTM D1559) [__ __ __ __]

*16. NUMBER OF BLOWS [__ __]

*17. MARSHALL FLOW (HUNDREDTHS OF AN INCH) [__ __ __ __.]
(AASHTO T245 OR ASTM D1559)

ENT'D JUN 01 2001

*18. HVEEM STABILITY (AASHTO T246 OR ASTM D1561) [46.]

*19. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) [__ __ __ __.]
(AASHTO T246 OR ASTM 1561)

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 8 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES (CONTINUED)	* STATE CODE [0 6] * SPS PROJECT CODE [4 8] * TEST SECTION NO. [0 5]

*1. LAYER NUMBER (FROM SHEET 4) [3]

*2. TYPE OF SAMPLES [__]
SAMPLES COMPACTED IN LABORATORY... 1
SAMPLES TAKEN FROM TEST SECTION... 2

*3. TYPE ASPHALT PLANT [1]

BATCH PLANT... 1 DRUM MIX PLANT... 2

OTHER (SPECIFY)... 3 _____

*4 TYPE OF ANTISTRIPPING AGENT USED [__N]
(SEE TYPE CODES, TABLE A.21)
OTHER (SPECIFY) _____

*5. AMOUNT OF ANTISTRIPPING AGENT USED LIQUID OR SOLID CODE [N]

*6. (If liquid, enter code 1, and amount as percent of asphalt cement weight. If solid, enter code 2 and amount as percent of aggregate weight.) [__ __.N]

ENT'D JUN 0 1 2001

PREPARER Jason Purcell EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 9 PLANT-MIXED ASPHALT BOUND LAYERS PLACEMENT DATA	* STATE CODE [0 6] * SPS PROJECT CODE [A 8] * TEST SECTION NO [0 5]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [0 9-2 7-9 9]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [0 9-2 9-9 9]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers		
Plant 1	[1]	Winton	[1 5]	[2 5]	[3]	[__]	[__]
Plant 2	[__]	_____	[__ __ __]	[__ __]	[__]	[__]	[__]
Plant 3	[__]	_____	[__ __ __]	[__ __]	[__]	[__]	[__]

Plant Type: Batch..... 1 Drum Mix.... 2 Other. .3 Specify_____

4. MANUFACTURER OF ASPHALT CONCRETE PAVER Cedar Rapids

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER CR551

6. SINGLE PASS LAYDOWN WIDTH (Feet) [1 5.8]

7. AC BINDER COURSE LIFT
   Layer Number [__ N]
   Nominal First Lift Placement Thickness (Inches) [__.N]
   Nominal Second Lift Placement Thickness (Inches) [__.N]

8. AC SURFACE COURSE LIFT
   Layer Number [__ 3]
   Nominal First Lift Placement Thickness (Inches) [2.2]
   Nominal Second Lift Placement Thickness (Inches) [2.2]

9. SURFACE FRICTION COURSE (If Placed)
   Layer Number [__ N]
   Nominal Placement Thickness (Inches) [__.N]

10. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
   Binder Course [__ + __ N]
   Surface Course [__ + __ N]
   Surface Friction Course [__ + __ N]

11. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
   Between lanes.. 1 Within lane.. 2
   (specify offset from O/S feet) [1 2.0]

12. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.)_____

ENT'D JUN 0 1 2001

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA
SHEET 10
PLANT-MIXED ASPHALT BOUND LAYERS
COMPACTION DATA

* STATE CODE [06]
* SPS PROJECT CODE [A8]
* TEST SECTION NO [05]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-27-99]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [09-29-99]
*3. LAYER NUMBER [3]

*4. MIXING TEMPERATURE (°F) [~~137~~ 279.]

5. LAYDOWN TEMPERATURES (°F)
Mean..... 285.
Minimum.... .... 270.
Standard Deviation... ___.__
Number of Tests .. ... 6.
Maximum... .. .. 300.

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	12.0				
7	B	Steel-Whl Tandem	___.__				
8	C	Steel-Whl Tandem	___.__				
9	D	Steel-Whl Tandem	___.__				
10	E	Pneumatic-Tired	7.0	____.			
11	F	Pneumatic-Tired	___.__	____.			
12	G	Pneumatic-Tired	___.__	____.			
13	H	Pneumatic-Tired	___.__	____.			
14	I	Single-Drum Vibr.	___.__		____	____	___.__
15	J	Single-Drum Vibr.	___.__		____.	____	___.__
16	K	Single-Drum Vibr.	___.__		____.	____	___.__
17	L	Single-Drum Vibr.	___.__		____	____	___.__
18	M	Double-Drum Vibr.	12.0		____.	____	___.__
19	N	Double-Drum Vibr.	___.__		____.	____	___.__
20	O	Double-Drum Vibr.	___.__		____.	____	___.__
21	P	Double-Drum Vibr.	___.__		____.	____	___.__
22	Q	Other					

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	M	~~M~~	
24	Coverages	3.	3	~~3~~	___.
	INTERMEDIATE				
25	Roller Code (E-Q)	E	E	E	
26	Coverages	2.	2.	2.	___.
	FINAL				
27	Roller Code (A-Q)	A	A	A	
28	Coverages	2.	2.	~~2~~	___.
29	Air Temperature (°F)	80	80.	___	___.
30	Compacted Thickness (In)	2.0	2.0	___.__	___.__
31	Curing Period (Days)	2.0	2.0	___.__	___.__

ENT'D JUN 01 2001

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA
SHEET 11
PLANT-MIXED ASPHALT BOUND LAYERS
DENSITY AND PROFILE DATA

* STATE CODE [04]
* SPS PROJECT CODE [A805]
* TEST SECTION NO. [05]

.. NUCLEAR DENSITY MEASUREMENTS

LAYER TYPE	Binder Course	Surface Course	Surface Friction Layer
Measurement Method (A, B, C)[1]	A	A	
Number of Measurement	12	12	
Average (pcf)	136.1	136.2	
Maximum (pcf)		138.0	
Minimum (pcf)		133.5	
Standard Deviation (pcf)		1.2	
Layer Number		03	

[1] Measurement Method Backscatter... A Direct Transmission... B Air Gap... C

2. MANUFACTURER OF NUCLEAR DENSITY GAUGE: Troxler
3. NUCLEAR DENSITY GAUGE MODEL NUMBER: 3401B
4. NUCLEAR DENSITY GAUGE IDENTIFICATION NUMBER: 988
5. NUCLEAR GAUGE COUNT RATE FOR STANDARDIZATION: 894
6. PROFILOGRAPH MEASUREMENTS

Profilograph Type California... 1 Rainhart... 2	N
Profile Index (Inches/Mile)	N
Interpretation Method Manual.. 1 Mechanical.. 2 Computer.. 3	N
Height of Blanking Band (Inches)	N
Cutoff Height (Inches)	N

7. SURFACE PROFILE USED AS BASIS OF INCENTIVE PAYMENT? (YES, NO): N

ENT'D JUN 01 2001

PREPARER Jason Ruzzelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [06] * SPS PROJECT CODE [A8] * TEST SECTION NO. [05]

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches)			
		DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
0+00	0	8.5	—	4.3	—
	36	8.1	—	4.4	—
	72	8.2	—	4.3	—
	108	8.0	—	4.1	—
	144	7.7	—	3.9	—
0+50	0	8.1	—	4.6	—
	36	8.2	—	4.4	—
	72	8.1	—	4.5	—
	108	8.3	—	3.9	—
	144	8.2	—	3.6	—
1+00	0	7.8	—	4.2	—
	36	7.8	—	4.0	—
	72	7.8	—	4.0	—
	108	7.5	—	3.5	—
	144	8.9	—	3.5	—
1+50	0	7.7	—	4.3	—
	36	7.2	—	4.4	—
	72	7.5	—	4.0	—
	108	7.9	—	3.8	—
	144	8.2	—	3.7	—
2+00	0	7.9	—	3.8	—
	36	7.8	—	3.7	—
	72	7.6	—	3.7	—
	108	8.0	—	3.7	—
	144	8.1	—	3.7	—
2+50	0	8.1	—	4.2	—
	36	8.3	—	4.1	—
	72	8.5	—	3.7	—
	108	8.8	—	4.1	—
	144	8.2	—	4.2	—
3+00	0	7.8	—	4.1	—
	36	8.0	—	4.2	—
	72	7.5	—	4.2	—
	108	7.9	—	4.3	—
	144	7.9	—	4.2	—
LAYER NUMBER		02	—	03	—

PREPARER Jason Pucinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 12 LAYER THICKNESS MEASUREMENTS	* STATE CODE [06] * SPS PROJECT CODE [A8] * TEST SECTION NO. [05]

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches)			
		DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
3+50	0	8.1	— — . —	4.1	— — . —
	6	8.0	— — . —	4.1	— — . —
	12	8.1	— — . —	3.9	— — . —
	18	8.2	— — . —	4.1	— — . —
	24	8.3	— — . —	4.1	— — . —
4+00	0	9.0	— — . —	4.2	— — . —
	6	8.6	— — . —	4.1	— — —
	12	8.6	— — . —	4.2	— — . —
	18	8.3	— — . —	4.1	— — . —
	24	8.0	— — . —	4.3	— — . —
4+50	0	8.3	— — . —	4.5	— — . —
	6	8.2	— — . —	4.7	— — . —
	12	8.4	— — . —	4.7	— — . —
	18	8.0	— — . —	4.5	— — . —
	24	8.7	— — . —	4.2	— — . —
5+00	0	8.3	— — . —	5.0	— — . —
	6	8.4	— — . —	4.8	— — . —
	12	8.5	— — . —	4.6	— — . —
	18	8.7	— — . —	4.5	— — . —
	24	9.2	— — . —	4.0	— — . —
5+90	0	9.1	— — . —	4.8	— — . —
	6	8.8	— — —	4.8	— — . —
	12	9.4	— — —	4.3	— — . —
	18	9.1	— — . —	4.4	— — . —
	24	9.0	— — . —	4.2	— — . —
—+— —	—	— — . —	— — —	— — . —	— — —
	—	— — . —	— — . —	— — . —	— — . —
	—	— — . —	— — . —	— — . —	— — . —
	—	— — . —	— — . —	— — . —	— — . —
	—	— — . —	— — —	— — . —	— — . —
—+— —	—	— — . —	— — . —	— — . —	— — . —
	—	— — . —	— — . —	— — . —	— — . —
	—	— — —	— — . —	— — —	— — . —
	—	— — . —	— — . —	— — . —	— — . —
	—	— — . —	— — . —	— — . —	— — . —
LAYER NUMBER		02	— —	03	— —

do not enter JS 6/7/01

ENT'D JUN 01 2001

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01

-- SPS-8 CONSTRUCTION DATA SHEET 13 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [04] * SPS PROJECT CODE [A8] * TEST SECTION NO [05]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [09-14-99]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [09-27-99]

*3. LAYER NUMBER (From Sheet 4) [2]

PRIMARY COMPACTION EQUIPMENT

*4. CODE TYPE [3]

COMPACTION TYPE CODES
Pneumatic - Tired... 1 Steel Wheel Tandem... 2 Single Drum Vibr... 3
Double Drum Vibr.... 4
Other (Specify)... 5 _____

*5. GROSS WEIGHT (TONS) [11.5]

*6. LIFT THICKNESSES
Nominal First Lift Placement Thickness (inches) [~~8~~ 9]
Nominal Second Lift Placement Thickness (inches) [ ]
Nominal Third Lift Placement Thickness (inches) [ ]
Nominal Fourth Lift Placement Thickness (inches) [ ]

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

7. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC) _____

ENT'D JUN 01 2001

PREPARER Jason Pinciroli EMPLOYER NLE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 14 SUBGRADE PREPARATION	* STATE CODE [06] * SPS PROJECT CODE [AB] * TEST SECTION NO. [05]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [05-15-99]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [09-14-99]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

COMPACTION EQUIPMENT TYPE CODES
Sheepsfoot... 1 Pneumatic Tired... 2 Steel Wheel Tandem... 3
Single Drum Vibr.... 4 Double Drum Vibr.... 5
Other (Specify)... 6 _____

*4. GROSS WEIGHT (TONS) [11.5]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__.N]
*6. STABILIZING AGENT 2	[N]	[__.N]

STABILIZING AGENT TYPE CODES
Portland Cement... 1 Lime... 2 Fly Ash, Class C... 3
Fly Ash, Class N... 4
Other (Specify)... 5 _____

*7. TYPICAL LIFT THICKNESS (INCHES) [__8]
(For Fill Sections Only)

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) _____

PREPARER Jason Pinarelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 15 CUT-FILL SECTION LOCATIONS	* STATE CODE [06] * SPS PROJECT CODE [A55] * TEST SECTION NO [02]

ORDER	*1 CUT-FILL TYPE	TEST SECTION STATION NUMBER	
		*2 START	*3 END
1		0 + 0 0	+
2		+	+
3		+	+
4		+	+
5		+	+
6		+	+
7		+	+
8		+	+
9		+	+
10		+	+

NOTES:

1. Indicate the type of subgrade construction with one of the following:

   Cut... 1 Fill. . 2 At-Grade... 3

2. Use one line for each cut, fill or at-grade zone present within the section boundaries.

PREPARER _____ EMPLOYER _____ DATE _____

SPS-8 CONSTRUCTION DATA SHEET 16 SUBGRADE EXCAVATION AND BACKFILLING SKETCH	* STATE CODE [0 6] * SPS PROJECT CODE [A 8] * TEST SECTION NO. [0 5]

SPS-8 CONSTRUCTION DATA SHEET 28 MISCELLANEOUS CONSTRUCTION NOTES AND COMMENTS	* STATE CODE [0 6] * SPS PROJECT CODE [A 8] * TEST SECTION NO. [0 5]

Provide any miscellaneous comments and notes concerning construction operations which may have an influence on the ultimate performance of the test sections or which may cause undesired performance differences to occur between test sections. Also include any quality control measurements or data for which space is not provided on other forms. Provide an indication of the basis for such measurements, such as an ASTM, AASHTO, or Agency standard test designation.

SPS-8 CONSTRUCTION DATA SHEET 4 LAYER DESCRIPTIONS	* STATE CODE [0 6] * SPS PROJECT CODE [A B] * TEST SECTION NO. [0 6]

*1 LAYER NUMBER	*2 LAYER DESCRIPTION	*3 MATERIAL TYPE CLASS	*4 LAYER THICKNESSES (Inches)			
			AVERAGE	MINIMUM	MAXIMUM	STD. DEV.
1	SUBGRADE(7)	[5 8]	[redacted]	[redacted]	[redacted]	[redacted]
2	[0 5]	[2 3]	[12.1]	11.3	12.8	0.4
3	[0 3]	[0 1]	[6.6]	5.9	7.3	0.3
4	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
5	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
6	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
7	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
8	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
9	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
10	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
11	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
12	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
13	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
14	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._
15	[__ __]	[__ __]	[_ _ _._]	_ _ _._	_ _ _._	_ _ _._

*5 DEPTH BELOW SURFACE TO "RIGID" LAYER (FEET) [__ __ . __]
(Rock, Stone, Dense Shale)

NOTES:

1. Layer 1 is the subgrade soil, the highest numbered layer is the pavement surface.

2. Layer description codes:

Overlay.....01	Base Layer.....05	Porous Friction Course..09
Seal/Tack Coat.....02	Subbase Layer . ..06	Surface Treatment.....10
Original Surface.....03	Subgrade..... . 07	Embankment (Fill).....11
HMAC Layer (Subsurface).04	Interlayer.....08	

3. The material type classification codes are presented in Tables A.5, A.6, A.7 and A.8 of the Data Collection Guide for Long Term Pavement Performance Studies, dated January 17, 1990.

4. Enter the average thickness of each layer and the minimum, maximum and standard deviation of the thickness measurements, if known.

SPS-8 CONSTRUCTION DATA SHEET 5 PLANT-MIXED ASPHALT BOUND LAYERS AGGREGATE PROPERTIES	* STATE CODE [0 6] * SPS PROJECT CODE [A 5] * TEST SECTION NO. [0 6]

*1. LAYER NUMBER (FROM SHEET 4) [3]

	COMPOSITION OF COARSE AGGREGATE	TYPE	PERCENT
*2.	Crushed Stone... 1 Gravel... 2 Crushed Gravel... 3	[3]	[1 0 0.]
*3.	Crushed Slag... 4 Manufactured Lightweight... 5	[__]	[__ __ __.]
*4.	Other (Specify)... 6 _____	[__]	[__ __ __.]
	COMPOSITION OF FINE AGGREGATE	TYPE	PERCENT
*5.	Natural Sand... 1	[1]	[1 0 0.]
*6.	Crushed or Manufactured Sand (From Crushed Gravel or	[__]	[__ __ __.]
*7.	Stone... 2 Recycled Concrete... 3 Other (Specify)... 4 _____	[__]	[__ __ __.]

*8. TYPE OF MINERAL FILLER [N]
Stone Dust... 1 Hydrated Lime... 2 Portland Cement... 3
Fly Ash... 4
Other (Specify)... 5 _____

BULK SPECIFIC GRAVITIES:

*9. Coarse Aggregate (AASHTO T85 or ASTM C127) 2.620 ~~[2.700]~~

*10. Fine Aggregate (AASHTO T84 or ASTM C128) ~~[2.710]~~ 2.690

*11. Mineral Filler (AASHTO T100 or ASTM D854) [__.__ N]

*12. Aggregate Combination (Calculated) [2.656]

13. Effective Specific Gravity of Aggregate Combination (Calculated) [2.659]

AGGREGATE DURABILITY TEST RESULTS
(SEE DURABILITY TEST TYPE CODES, TABLE A.13)

	TYPE OF AGGREGATE	TYPE OF TEST	RESULTS
14.	Coarse	[__ N]	[__ __ __.__ __ N]
15.	Coarse	[__ N]	[__ __ __.__ __ N]
16.	Coarse	[__ N]	[__ __ __.__ __ N]
17.	Coarse and Fine - Combined	[__ N]	[__ __ __.__ __ N]

18. POLISH VALUE OF COARSE AGGREGATES
SURFACE LAYER ONLY (AASHTO T279, ASTM D3319) __ N.

ENT'D JUN 01 2001

PREPARER Jason Pinarelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 6 PLANT-MIXED ASPHALT BOUND LAYERS ASPHALT CEMENT PROPERTIES	* STATE CODE [06] * SPS PROJECT CODE [A8] * TEST SECTION NO. [05]

*1. LAYER NUMBER (FROM SHEET 4) [3]

*2. ASPHALT GRADE (SEE ASPHALT CODE SHEET, TABLE A.16) [09]
(IF OTHER, SPECIFY) _____

*3. SOURCE (SEE SUPPLY CODE SHEET, TABLE A.14) [18]
(IF OTHER, SPECIFY) _____

4. SPECIFIC GRAVITY OF ASPHALT CEMENT (AASHTO T228) ~~[1.010]~~ 1.028

GENERAL ASPHALT CEMENT PROPERTIES (If available from supplier)

5. VISCOSITY OF ASPHALT AT 140°F (POISES) (AASHTO T202) [1865.]

6. VISCOSITY OF ASPHALT AT 275°F (CENTISTOKES) (AASHTO T202) [239.33]

7. PENETRATION AT 77°F (AASHTO T49) (TENTHS OF A MM) (100 g., 5 sec.) [6.]

ASPHALT MODIFIERS (SEE TYPE CODE, A.15)

	TYPE	QUANTITY (%)
8. MODIFIER #1	[N]	[N]
9. MODIFIER #2 (IF OTHER, SPECIFY) _____	[N]	[N.]

10. DUCTILITY AT 77°F (CM) (AASHTO T51) [___.]

11. DUCTILITY AT 39.2°F (CM) (AASHTO T51) [___.]

12. TEST RATE FOR DUCTILITY MEASUREMENT AT 39.2°f (CM/MIN) [___.]

13. PENETRATION AT 39.2°F (AASHTO T49) (TENTHS OF A MM) (200 g., 60 sec.) [___.]

14. RING AND BALL SOFTENING POINT (AASHTO T53) (°F) [___.]

NOTE: If emulsified or cutback asphalt was used, enter "N" in the spaces for "Original Asphalt Cement Properties".

ENT'D JUN 01 2001

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-07

SPS-8 CONSTRUCTION DATA SHEET 7 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES	* STATE CODE [0 6] * SPS PROJECT CODE [A 8] * TEST SECTION NO [0 6]

*1. LAYER NUMBER (FROM SHEET 4) [3]

*2. TYPE OF SAMPLES [__]
SAMPLES COMPACTED IN LABORATORY... 1
SAMPLES TAKEN FROM TEST SECTION... 2

*3. MAXIMUM SPECIFIC GRAVITY (NO AIR VOIDS) [2.471]
(AASHTO T209 OR ASTM D2041)

BULK SPECIFIC GRAVITY (ASTM D1188)

*4. MEAN [__.__ __ __] NUMBER OF TESTS [__ __.]

5. MINIMUM [__.__ __ __] MAXIMUM [__.__ __ __]

6. STD. DEV. [__.__ __ __]

ASPHALT CONTENT (PERCENT WEIGHT OF TOTAL MIX)
(AASHTO T164 OR ASTM D2172)

*7. MEAN [4.867] NUMBER OF SAMPLES [03.]

8. MINIMUM [4.800] MAXIMUM [4.900]

9. STD. DEV. [0.058]

PERCENT AIR VOIDS

*10. MEAN [2.471] NUMBER OF SAMPLES [03.]

11. MINIMUM [__.__ __ __] MAXIMUM [__.__ __ __]

12. STD. DEV. [__.__ __ __]

*13. VOIDS IN MINERAL AGGREGATE (PERCENT) [__ __.__]

*14. EFFECTIVE ASPHALT CONTENT (PERCENT) [__ __ __]

*15. MARSHALL STABILITY (LBS) (AASHTO T245 OR ASTM D1559) [__ __ __ __.]

*16. NUMBER OF BLOWS [__ __]

*17. MARSHALL FLOW (HUNDREDTHS OF AN INCH) [__ __ __ __.]
(AASHTO T245 OR ASTM D1559)

ENT'D JUN 01 2001

*18. HVEEM STABILITY (AASHTO T246 OR ASTM D1561) [__46.]

*19. HVEEM COHESIOMETER VALUE (GRAMS/25 MM OF WIDTH) [__ __ __ __.]
(AASHTO T246 OR ASTM 1561)

PREPARER Jason Puccinelli EMPLOYER NLE DATE 5-24-01

SPS-8 CONSTRUCTION DATA SHEET 8 PLANT-MIXED ASPHALT BOUND LAYERS MIXTURE PROPERTIES (CONTINUED)	* STATE CODE [0 6] * SPS PROJECT CODE [A 8] * TEST SECTION NO. [0 6]

*1. LAYER NUMBER (FROM SHEET 4) [3]

*2. TYPE OF SAMPLES [__]
SAMPLES COMPACTED IN LABORATORY... 1
SAMPLES TAKEN FROM TEST SECTION .. 2

*3. TYPE ASPHALT PLANT [1]

BATCH PLANT... 1 DRUM MIX PLANT... 2

OTHER (SPECIFY)... 3 _____

*4. TYPE OF ANTISTRIPPING AGENT USED [__ N]
(SEE TYPE CODES, TABLE A.21)
OTHER (SPECIFY) _____

*5. AMOUNT OF ANTISTRIPPING AGENT USED LIQUID OR SOLID CODE [N]

*6. (If liquid, enter code 1, and amount as percent of asphalt cement weight. If solid, enter code 2 and amount as percent of aggregate weight.) [__ __.N]

PREPARER Jason Purcinelli EMPLOYER NCE DATE 5-29-07

SPS-8 CONSTRUCTION DATA SHEET 9 PLANT-MIXED ASPHALT BOUND LAYERS PLACEMENT DATA	* STATE CODE [0 6] * SPS PROJECT CODE [A B] * TEST SECTION NO. [0 6]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-27-99]

*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [09-29-99]

*3 ASPHALT CONCRETE PLANT AND HAUL

	Type	Name	Haul Distance (Mi)	Time (Min)	Layer Numbers
Plant 1	[1]	Winton	[15]	[25]	[3] [__] [__]
Plant 2	[__]	_____	[___]	[___]	[__] [__] [__]
Plant 3	[__]	_____	[___]	[___]	[__] [__] [__]

Plant Type: Batch..... 1 Drum Mix.... 2 Other...3 Specify_____

4 MANUFACTURER OF ASPHALT CONCRETE PAVER Cedar Rapids

5. MODEL DESIGNATION OF ASPHALT CONCRETE PAVER CR551

6. SINGLE PASS LAYDOWN WIDTH (Feet) [15.8]

7. AC BINDER COURSE LIFT
   Layer Number [__ N]
   Nominal First Lift Placement Thickness (Inches) [__.N]
   Nominal Second Lift Placement Thickness (Inches) [__.N]

8. AC SURFACE COURSE LIFT
   Layer Number [__ 3]
   Nominal First Lift Placement Thickness (Inches) [3.5]
   Nominal Second Lift Placement Thickness (Inches) [2.0]

9. SURFACE FRICTION COURSE (If Placed)
   Layer Number [__ N]
   Nominal Placement Thickness (Inches) [__.N]

10. TEST SECTION STATION OF TRANSVERSE JOINTS (within test section)
    Binder Course [__ + __ N]
    Surface Course [__ + __ N]
    Surface Friction Course [__ + __ N]

11. LOCATION OF LONGITUDINAL SURFACE JOINT [1]
    Between lanes.. 1 Within lane.. 2
    (specify offset from O/S feet) [12.0]

12. SIGNIFICANT EVENTS DURING CONSTRUCTION (disruptions, rain, equip. problems, etc.)_____

ENT'D JUN 01 2001

PREPARER Tom Piccinelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 10 PLANT-MIXED ASPHALT BOUND LAYERS COMPACTION DATA	* STATE CODE [06] * SPS PROJECT CODE [A8] * TEST SECTION NO [06]

*1. DATE PAVING OPERATIONS BEGAN (Month-Day-Year) [09-27-99]
*2. DATE PAVING OPERATIONS COMPLETED (Month-Day-Year) [09-29-99]
*3. LAYER NUMBER [3]

*4. MIXING TEMPERATURE (°F) [279.]

5. LAYDOWN TEMPERATURES (°F)
Mean..... .
Minimum..... 270.
Standard Deviation... __.__
Number of Tests ..... 6.
Maximum. .... 300.

ROLLER DATA

	Roller Code #	Roller Description	Gross Wt (Tons)	Tire Press. (psi)	Frequency (Vibr./Min)	Amplitude (Inches)	Speed (mph)
6	A	Steel-Whl Tandem	12.0				
7	B	Steel-Whl Tandem	__.__				
8	C	Steel-Whl Tandem	__.__				
9	D	Steel-Whl Tandem	__.__				
10	E	Pneumatic-Tired	70	____.			
11	F	Pneumatic-Tired	__.__	____.			
12	G	Pneumatic-Tired	__.__	____.			
13	H	Pneumatic-Tired	__.__	____.			
14	I	Single-Drum Vibr.	__.__		____.	____.	__.__
15	J	Single-Drum Vibr.	__.__		____.	____.	__.__
16	K	Single-Drum Vibr.	__.__		____.	____.	__.__
17	L	Single-Drum Vibr.	__.__		____.	____.	__.__
18	M	Double-Drum Vibr.	12.0		____.	____.	__.__
19	N	Double-Drum Vibr.	__.__		____.	____.	__.__
20	O	Double-Drum Vibr.	__.__		____.	____.	__.__
21	P	Double-Drum Vibr.	__.__		____.	____.	__.__
22	Q	Other					

ENT'D JUN 01 2001

	COMPACTION DATA	First Lift	Second Lift	Third Lift	Fourth Lift
	BREAKDOWN				
23	Roller Code (A-Q)	M	M	M	
24	Coverages	3	3	3	__.
	INTERMEDIATE				
25	Roller Code (A-Q)	E	E	E	
26	Coverages	2.	2.	2.	__.
	FINAL				
27	Roller Code (A-Q)	A	A	D	
28	Coverages	2.	2.	2.	__.
29	Air Temperature (°F)	80.	80	80	___.
30	Compacted Thickness (In)	3.1	2.0	2.0	__.__
31	Curing Period (Days)	2.0	2.0	2.0	__.__

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-24-01

-- SPS-8 CONSTRUCTION DATA SHEET 11 PLANT-MIXED ASPHALT BOUND LAYERS DENSITY AND PROFILE DATA	* STATE CODE [06] * SPS PROJECT CODE [A3] * TEST SECTION NO. [06]

1. NUCLEAR DENSITY MEASUREMENTS

LAYER TYPE	Binder Course	Surface Course	Surface Friction Layer
Measurement Method (A, B, C)[1]	___	A	___
Number of Measurement	___ ___	12	___ ___
Average (pcf)	___.___	139.7	___.___
Maximum (pcf)	___.___	141.9	___.___
Minimum (pcf)	___.___	137.4	___.___
Standard Deviation (pcf)	___.___	___1.3	___.___
Layer Number	___ ___	___3	___ ___

[1] Measurement Method Backscatter .. A Direct Transmission... B Air Gap... C

2. MANUFACTURER OF NUCLEAR DENSITY GAUGE: Troxler

3. NUCLEAR DENSITY GAUGE MODEL NUMBER: 3401B

4. NUCLEAR DENSITY GAUGE IDENTIFICATION NUMBER: 9858

5. NUCLEAR GAUGE COUNT RATE FOR STANDARDIZATION: ___894

6. PROFILOGRAPH MEASUREMENTS

Profilograph Type	California... 1 Rainhart... 2	N
Profile Index (Inches/Mile)		___ NN
Interpretation Method	Manual.. 1 Mechanical.. 2 Computer.. 3	N
Height of Blanking Band (Inches)		___.___ NN
Cutoff Height (Inches)		___.___ NN

7. SURFACE PROFILE USED AS BASIS OF INCENTIVE PAYMENT? (YES, NO): N

ENT'D JUN 01 2001

PREPARER Jason Pinciarelli EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA
SHEET 12
LAYER THICKNESS MEASUREMENTS

* STATE CODE [04]
* SPS PROJECT CODE [A8]
* TEST SECTION NO. [06]

SHEET 1 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches)			
		DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
0+00	0	11.4	— — . —	— 7.3	— — . —
	36	11.7	— — . —	— 6.7	— — . —
	72	11.7	— — . —	— 6.4	— — . —
	108	12.0	— — . —	— 6.6	— — . —
	144	12.2	— — . —	— 6.4	— — . —
0+50	0	12.2	— — . —	— 7.0	— — . —
	36	12.0	— — . —	— 6.7	— — . —
	72	12.0	— — . —	— 6.5	— — . —
	108	11.3	— — . —	— 6.7	— — . —
	144	11.7	— — . —	— 6.4	— — . —
1+00	0	11.8	— — . —	— 7.0	— — . —
	36	11.8	— — . —	— 6.9	— — . —
	72	11.4	— — . —	— 6.9	— — . —
	108	11.7	— — . —	— 6.6	— — . —
	144	11.6	— — . —	— 6.5	— — . —
1+50	0	12.1	— — . —	— 6.7	— — . —
	36	11.8	— — . —	— 6.6	— — . —
	72	11.8	— — . —	— 6.3	— — . —
	108	11.7	— — . —	— 6.7	— — . —
	144	11.9	— — . —	— 6.2	— — . —
2+00	0	11.8	— — . —	— 6.6	— — . —
	36	12.1	— — . —	— 6.2	— — . —
	72	12.1	— — . —	— 6.1	— — . —
	108	12.4	— — . —	— 6.3	— — . —
	144	12.4	— — . —	— 5.9	— — . —
2+50	0	12.1	— — . —	— 6.7	— — . —
	36	12.4	— — . —	— 6.6	— — . —
	72	12.4	— — . —	— 6.4	— — . —
	108	12.2	— — . —	— 6.6	— — . —
	144	12.4	— — . —	— 6.2	— — . —
3+00	0	12.0	— — . —	— 6.7	— — . —
	36	12.6	— — . —	— 6.2	— — . —
	72	12.5	— — . —	— 6.1	— — . —
	108	12.3	— — . —	— 6.3	— — . —
	144	12.5	— — . —	— 6.3	— — . —
LAYER NUMBER		02	— —	03	— —

PREPARER Jason Puccinelli EMPLOYER NUE DATE 5-29-01

SPS-8 CONSTRUCTION DATA
SHEET 12
LAYER THICKNESS MEASUREMENTS

* STATE CODE [04]
* SPS PROJECT CODE [A8]
* TEST SECTION NO [06]

SHEET 2 OF 2

STATION NUMBER	OFFSET (Inches)	LAYER THICKNESS MEASUREMENTS (Inches) DENSE GRADED AGGREGATE BASE	PORTLAND CEMENT CONCRETE SURFACE	ASPHALT SURFACE AND BINDER	SURFACE FRICTION LAYER
3+50	0	12.6	— — . —	— 6.7	— — . —
	36	12.6	— — . —	— 6.8	— — . —
	72	12.5	— — . —	— 6.9	— — . —
	108	12.5	— — . —	— 6.9	— — . —
	144	12.5	— — . —	— 6.9	— — . —
4+00	0	12.5	— — . —	— 6.3	— — . —
	36	12.8	— — . —	— 6.3	— — . —
	72	12.6	— — . —	— 6.3	— — . —
	108	12.2	— — . —	— 6.6	— — . —
	144	12.0	— — . —	— 6.9	— — . —
4+50	0	12.8	— — . —	— 6.4	— — . —
	36	12.7	— — . —	— 6.7	— — . —
	72	12.4	— — . —	— 6.7	— — . —
	108	12.0	— — . —	— 7.0	— — . —
	144	12.1	— — . —	— 7.0	— — . —
5+00	0	12.2	— — . —	— 6.7	— — . —
	36	12.4	— — . —	— 6.9	— — . —
	72	12.2	— — . —	— 6.6	— — . —
	108	12.4	— — . —	— 6.8	— — . —
	144	12.5	— — . —	— 6.9	— — . —
5+57	0	12.2	— — . —	— 6.8	— — . —
	36	11.8	— — . —	— 6.9	— — . —
	72	11.5	— — . —	— 6.9	— — . —
	108	12.1	— — . —	— 6.9	— — . —
	144	12.1	— — . —	— 6.9	— — . —
—+— —		— — . —	— — . —	— — . —	— — . —
		— — . —	— — . —	— — . —	— — . —
		— — . —	— — . —	— — . —	— — . —
		— — . —	— — . —	— — . —	— — . —
		— — . —	— — . —	— — . —	— — . —
—+— —		— — . —	— — . —	— — . —	— — . —
		— — . —	— — . —	— — . —	— — . —
		— — . —	— — . —	— — . —	— — . —
		— — . —	— — . —	— — . —	— — . —
		— — . —	— — . —	— — . —	— — . —
LAYER NUMBER		02	— —	03	— —

? do not enter this 6/7/01

ENTD JUN 01 2001

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01

-- SPS-8 CONSTRUCTION DATA SHEET 13 UNBOUND AGGREGATE BASE MATERIAL PLACEMENT	* STATE CODE [06] * SPS PROJECT CODE [A8] * TEST SECTION NO. [06]

*1. UNBOUND BASE MATERIAL PLACEMENT BEGAN (Month-Day-Year) [09-14-99]

*2. UNBOUND BASE MATERIAL PLACEMENT COMPLETED (Month-Day-Year) [09-27-99]

*3. LAYER NUMBER (From Sheet 4) [2]

PRIMARY COMPACTION EQUIPMENT

*4. CODE TYPE [3]

COMPACTION TYPE CODES
Pneumatic - Tired... 1 Steel Wheel Tandem... 2 Single Drum Vibr. .. 3
Double Drum Vibr.... 4
Other (Specify)... 5 _____

*5. GROSS WEIGHT (TONS) [11.5]

*6. LIFT THICKNESSES
Nominal First Lift Placement Thickness (inches) [8]
Nominal Second Lift Placement Thickness (inches) [6]
Nominal Third Lift Placement Thickness (inches) [ ]
Nominal Fourth Lift Placement Thickness (inches) [ ]

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) _____

PREPARER Jason Pinnell EMPLOYER NCE DATE 5-29-01

SPS-8 CONSTRUCTION DATA SHEET 14 SUBGRADE PREPARATION	* STATE CODE [06] * SPS PROJECT CODE [A8] * TEST SECTION NO. [06]

*1. SUBGRADE PREPARATION BEGAN (Month-Day-Year) [05-15-99]

*2. SUBGRADE PREPARATION COMPLETED (Month-Day-Year) [09-14-99]

PRIMARY COMPACTION EQUIPMENT

*3. CODE TYPE [4]

COMPACTION EQUIPMENT TYPE CODES
Sheepsfoot... 1 Pneumatic Tired... 2 Steel Wheel Tandem... 3
Single Drum Vibr.... 4 Double Drum Vibr.... 5
Other (Specify)... 6 _____

*4. GROSS WEIGHT (TONS) [11.5T]

	TYPE	PERCENT
*5. STABILIZING AGENT 1	[N]	[__.N]
*6. STABILIZING AGENT 2	[N]	[__.N]

STABILIZING AGENT TYPE CODES
Portland Cement... 1 Lime... 2 Fly Ash, Class C... 3
Fly Ash, Class N... 4
Other (Specify)... 5 _____

*7. TYPICAL LIFT THICKNESS (INCHES) [_8]
(For Fill Sections Only)

DENSITY DATA IS RECORDED ON SAMPLING DATA SHEET 8-1

8. SIGNIFICANT EVENTS DURING CONSTRUCTION (DISRUPTIONS, RAIN, EQUIPMENT PROBLEMS, ETC.) _____

PREPARER Jason Puccinelli EMPLOYER NCE DATE 5-29-01